

# Installation Manual

Please read carefully prior  
to installation and servicing.

SAVE THESE INSTRUCTIONS



## PELLET BOILER PES 12–32

CMP 06.2 US\_VA606

ENGLISH — USA



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Subject to modifications

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# 1 Dear Customer

**MEco is specialist in pellet heating, licensed by ÖkoFEN.**

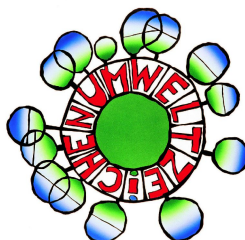
Expertise, innovation and quality from a single source. It is based on this tradition that MEco takes on future challenges. We are delighted that also you have decided to purchase a MEco product.

- This instruction manual is intended to help you operate the product safely, properly and economically.
- Please read this instruction manual right through and take note of the safety warnings.
- Keep all documentation supplied with this unit in a safe place for future reference. Please pass on the documentation to the new user if you decide to part with the unit at a later date.
- During installation and/or first start up the service engineer must carry out the following work.
- The installation has to be performed by a qualified installer.
- Please contact your authorised dealer if you have any questions.



MEco places great importance on the development of new products. Our R&D department continues to question accepted solutions and works continually on new improvements. That is how we maintain our technological lead. We have already received several awards for our products in Austria and abroad.

Our products fulfil European and USA requirements regarding quality, efficiency and emissions.





## 2 Use only for the purpose intended

The pellet boiler is designed to heat water for central or other indirect heating systems and hot water supply for buildings. It is not permissible to use the pellet boiler for any other purpose. Reasonable foreseeable inadvertent uses for the pellet boiler are not known.

The boiler fulfils the requirements of UL 391, "Standard for Safety for Solid-Fuel and Combination-Fuel Central and Supplementary Furnaces," 2006, and CAN/CSA-B366.1-M91, "Solid-Fuel-Fired Central Heating Appliances"

OMNI Certificate:


**Models: Pellematic PES 12-20, 25-32, 36-56**  
**Pellet Fuel-Fired Boiler**

Date Issued: September 2009  
Project: 429-S-02-2  
Issued to: ÖkoFEN Forschungs- und Entwicklungs Ges.m.b.H.  
Gewerbepark 1  
A-4133 Niederkappel  
Austria


Products listed to:


- UL 391, "Standard for Safety for Solid-Fuel and Combination-Fuel Central and Supplementary Furnaces," 2006.
- CAN/CSA-B366.1-M91, "Solid-Fuel-Fired Central Heating Appliances."

The models listed above are eligible to bear the mark shown.

Tested & Listed By  Portland Oregon USA  
OMNI-Test Laboratories, Inc.

Issued by: OMNI-Test Laboratories, Inc.  
13327 NE Airport Way  
Portland, Oregon 97230

  
Paul E. Tiegs, President

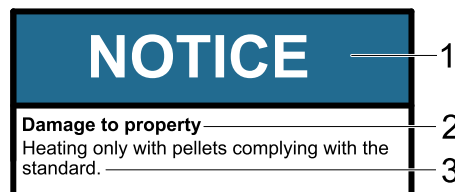
  
Gerald Coles, Accreditation Manager

### 3 Types of safety warning sign

The warning signs use the following symbols and text.

#### Types of safety warning sign

1. Risk of injury
2. Consequences of risk
3. Avoiding risk



#### 1. Risk of injury:

Danger - indicates a situation that could lead to death or life-threatening injury.



Warning - indicates a situation that could lead to life-threatening or serious injury.



Caution - indicates a situation that could lead to injury.



Note - indicates a situation that could lead to property damage.



#### 2. Consequences of risk

Effects and consequences resulting from incorrect operation.

#### 3. Avoiding risk

Observing safety instructions ensures that the heating system is operated safely.


## 4 Warnings and safety instructions

Observing safety instructions ensures that the heating system is operated safely.


### 4.1 Basic safety instructions


- Never get yourself into danger; give your own safety the utmost priority.
- Keep children away from the boiler room and storage room.
- Observe all safety warnings on the boiler and in this user manual.
- Observe all instructions relating to maintenance, servicing and cleaning.
- The pellet heating system may only be installed and started up for the first time by an authorised installer. Professional installation and start up is the prerequisite for safe and economical operation.
- Never make any changes to the heating system or flue gas system.
- Never close or remove safety valves.

### 4.2 Warning signs

	<b>DANGER</b>
<b>Risk of poisoning</b> Make sure that the pellet boiler is supplied with sufficient combustion air. The openings in the combustion air inlet must never be partially or completely closed. Ventilation systems, central vacuum cleaning systems, extractor fans, air conditioning systems, flue gas blowers, dryers or similar equipment must never be allowed to draw air from the boiler room and cause a drop in pressure. The boiler must be connected tight to the chimney using a flue gas tube. Clean the chimney and the flue gas tube at regular intervals. The boiler room and pellet storage room must be sufficiently supplied with air and ventilated. Before entering the storage room it must be ventilated with sufficient air and the heating system switched off.	

	<b>DANGER</b>
<b>Risk of electric shock</b> Switch off the system before performing work on the boiler.	

	<b>DANGER</b>
<b>Risk of explosion</b> Never burn petrol, diesel, engine oil or other explosive materials. Never use liquids or chemicals to ignite the pellets. Switch off the heating system before filling the storage room.	

	<b>DANGER</b>
<b>Risk of fire</b> Do not store any flammable materials in the boiler room. Do not hang out any washing in the boiler room. Always close the boiler door.	



## WARNING

### Risk of burns

Do not touch the flue spigot or the flue gas tube.  
 Do not reach into the ash chamber.  
 Use gloves to empty the ash box.  
 Do not clean the boiler until it has been allowed to cool down.

## CAUTION

### Risk of cut injuries due to sharp edges.

Use gloves for performing all work on the boiler.

## NOTICE

### Damage to property

Heat the Auto pellet heating system using pellets that comply with PFI premium specifications only.

## NOTICE

### Damage to property

Do not use the heating system if it, or any of its components, come into contact with water.  
 If water damage occurs, have the heating system checked by an MEco service technician and have any damaged parts replaced.

## 4.3 What to do in an emergency



## DANGER

### Risk to life

Never get yourself into danger; give own safety the utmost priority.

### What to do in the event of a fire

- Switch off the heating system.
- Call the fire brigade
- Use approved fire extinguishers (fire protection class ABC).

### What to do if you smell smoke

- Switch off the heating system.
- Close the doors leading to living areas.
- Ventilate the boiler room.

## 5 Prerequisites for installing a pellet boiler

You must fulfil the following conditions before operating a fully automatic pellet boiler.

### 5.1 Guidelines and standards for installing a pellet boiler


Overview of standards and guidelines applying to the installation of a pellet boiler.

Check whether you need to obtain planning permission or approval from the authorities for installing a new heating system or changing your existing system. Legislation in your country must be observed.

### 5.2 Boiler room

The pellet boiler is installed in the boiler room.

#### 1. Safety instructions for the boiler room

	<h2 style="margin: 0;">DANGER</h2>
<p><b>Risk of fire</b>          Do not store flammable materials or liquids in the vicinity of the pellet boiler.          Do not permit unauthorised persons to enter the boiler room          - children are to be kept out.          Always close the boiler door.</p>	

#### 2. Air supply and ventilation of boiler room

The boiler room must be fitted with air supply and ventilation openings. You must comply with state and local regulations.

#### 3. Combustion air supply

The pellet boiler needs a supply of combustion air. The supply of combustion air can:

- a. take place using one or more air supply and ventilation openings in the boiler room in total min. 31 in<sup>2</sup>.
- b. **or** through a special air supply line directly from outside, where the diameter of the air supply line must be at least 4" in for type PE(S) 12 – PE(S) 32. Ambient air independent operation of PES 36-56 types is also available on request.

Never operate the pellet boiler if the air intake openings are partially or completely closed.

Contaminated combustion air can cause damage to the pellet boiler. Never store or use cleaning detergents containing chlorine, nitrobenzene or halogen in the room where the heating system is installed, if combustion air is drawn directly from the room. It is recommended that no washing or drying of laundry is done in the boiler room or where the boiler may draw air from.

Do not hang out washing in the boiler room.

Prevent dust from collecting at the combustion air intake to the pellet boiler.

#### 4. Damage due to frost and humid air

The boiler room must be frost-proof to ensure trouble-free operation of the heating system. The temperature of the boiler room must not fall below 37°F and must not exceed 90°F. The air humidity in the boiler room must not exceed 70%.

#### 5. Danger for animals

Make sure that household pets and other small animals cannot enter the boiler room. Fit mesh over any openings.

#### 6. Flooding

If there is a risk of flooding, switch off the pellet boiler in good time and disconnect from the power supply before water enters the boiler room. You must have all components that come into contact with water replaced, before you start up the pellet boiler again.

## 5.3 Flue gas system

The flue gas system consists of a chimney and a flue gas tube. The flue gas tube connects the pellet heating system to the chimney. The chimney leads the flue gas from the pellet heating system out into the open.

### 1. Design of the chimney

The dimensions and design of the chimney is very important. The chimney must be able to ensure sufficient draft to safely draw away the flue gas regardless of the status of the boiler. Low flue gas temperatures can cause sooting and moisture damage on chimneys that are not insulated. For this reason **moisture-resistant chimneys** (stainless steel or ceramic) should be used. An existing chimney that is not damp-resistant needs to be renovated before use. Follow guidelines below:

Boiler size		PE(S) 12 – 20	PE(S) 25 – 32	PE(S) 36 – 56
Flue gas tube diameter (at boiler)	in	5	6	7
Flue gas temp. / rated power	°F	320	320	360
Flue gas temp. / partial load	°F	212	212	230
Min. draft – full load/part load	in/wc	0.03/0.01		

Chimney size	Min. Height
6"x6"	17ft
7"x7"	16ft
8"x8"	16ft
6" round	19ft
7" round	17ft

Recommended and UL-103HT approved chimney materials are:

- Selkirk sure temp
- Supervent (JSC)
- Security chimneys (secure temp ASHT)

Use heavy gauge (26ga or better) black smoke pipe to connect to existing chimney

## CAUTION

### Unregulated combustion

Please observe that combustion air openings and flue pipes are not reduced in size or closed. Make end user aware of these guidelines and their potential danger.

### 2. Flue gas temperature

The flue gas temperatures are the same for all boiler types:

The dewpoint of flue gas with wood pellets (max. 10% water content) is approx. 120°F.

It is possible to increase the flue gas temperature to prevent condensation inside the chimney and avoid damage due to damp. Only authorised specialist personnel may increase the flue gas temperature.

### Note

The increase in flue gas temperature results in reduced efficiency and thus increases fuel consumption.

### 3. Negative pressure of the chimney

The boiler must be connected to a chimney or a vertical venting system that is capable of handling and producing a negative breeching pressure of  $-0.020$  "WC ( $-5\text{Pa}$ ). Use a draft gauge to verify the indicated draft value, adjust barometric damper as required. Drill a small hole in the connection pipe at about 2" from the boiler flue outlet and use this hole as your measuring point.

#### Chimney draft

The suction effect of the chimney draft must extend as far as the pellet boiler. The maximum flow rate that can be drawn through the chimney limits the maximum performance of the pellet boiler. The boiler performance must be reduced if the chimney does not possess the necessary cross-section. This may only be performed by authorised personnel.



## NOTICE

**Too strong a chimney draft increases heat loss while idling and reduces the efficiency of the heating system.**

We recommend installing a chimney draft regulator (barometric damper). Chimney draft regulators are installed directly into the flue gas tube or chimney.

Your state and local regulations must be observed.

### 4. Power venter

AutoPellet boilers are approved by the manufacturer for installation with the Field Controls SWGAF power venter which is approved for wood pellet burning appliances.

Boiler installed with SWGAF power venters must follow all manufacturer's installations and must comply with all applicable codes from agencies having authority over the installation.



### 5. Cleaning

Clean the flue gas tube and chimney regularly.



## DANGER

#### Risk of chimney fire

Creosote-formation and need for removal: Low gas flue temperature can cause creosote. The creosote condense in the relatively cool chimney. As a result, creosote residue accumulates on the flue lining. When ignited, this creosote makes a hot fire. The chimney and the chimney connector should be inspected at least twice monthly during the heating season to determine if a creosote buildup has occurred. If creosote has accumulated it should be removed to reduce the risk of a chimney fire.

## NOTICE

#### Oxidation of chimney

Do not use metal brushes to clean chimneys made of stainless steel.

Your state and local regulations must be observed.

## 5.4 Safety systems

The following safety measures are the prerequisite for safe operation of your system.

### Emergency stop switch

Every heating system must be able to be switched off with an Emergency Stop switch. The Emergency Stop switch must be outside of the boiler room.



### Safety valve

The hydraulic system must be equipped with a safety valve. This valve opens before the pressure inside the heating system increases to max. 43 P.S.I.. The safety valve must be installed at the highest point of the boiler, must not be locked and must be within 3.28 ft / 39.37 in of the boiler. A 30 lb/sq in relief valve is supplied with each boiler.



### Safety temperature sensor

The pellet boiler is equipped with a safety temperature sensor. This is located on the pellet boiler. If the boiler temperature exceeds 203°F then the heating system switches off.



### Low water cut off

The hydraulic system must be equipped with a low water cut off. Falls the water level below a certain level, the low water cut off switches off the heating system.



## NOTICE

### Starting up

Starting up for the first time has to be performed only by an authorized service technician.



## 5.5 Installation with an existing boiler

A pellet fired boiler and an oil boiler can be flued only individually into an existing chimney providing the following conditions are met:

- All state and local codes permit the specific installation
- Electrical Interlocks are in place to prevent simultaneous operations.
- A mechanical lock-out device must also be in place to prevent simultaneous operations.
- At any given time, only one boiler can be vented into the chimney flue. Allow either boiler to completely shut down and cool off before changing the venting system.
- The flue must be of adequate size to handle the combustion products of either appliance.

### NOTICE

**Insecure and uneconomic operation**

Place the boiler according to the minimum clearances to the existing boiler.

### CAUTION

**Insecure installation**

In the case of a connecting boiler (existing boiler) contact an MEco technician for compliance information before connecting.

The following unit is approved for connecting with the MEco pellet boiler:

Model number connected unit: \_\_\_\_\_

Item number connected unit: \_\_\_\_\_



### DANGER

**Escape of flue gas**

Do not connect this unit to a chimney flue serving another appliance.

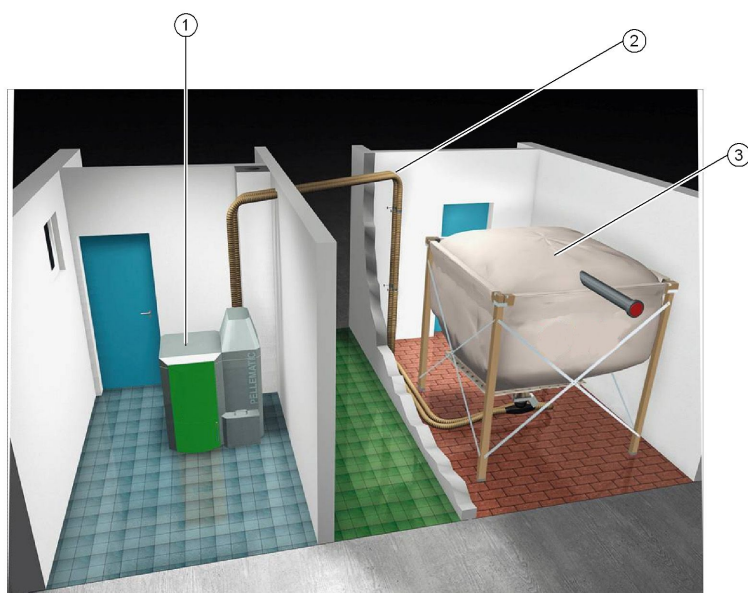
## 6 Product description

The description of the product is intended to provide an overview of the components that make up an MEco pellet heating system, the parts of the pellet boiler and advice on where you can find more information.

**The MEco pellet heating system consists of 3 components**

1	Pellet boiler
2	Conveyor system
3	Storage system – textile tank

### Pellet boiler with textile tank



The MEco concept features different sizes of design and type for each component. These are compatible and designed to match.

## 6.1 The pellet boiler

The pellet boiler is equipped with an automatic cleaning system, an ash box with ash compression system and an integrated return water temperature control. The installed programmable logic controller system enables fully automatic operation and highest efficiency. MEco also offers an optional automatic de-ashing system for the highest level of cleanliness and comfort.

### Pellematic types and power ratings

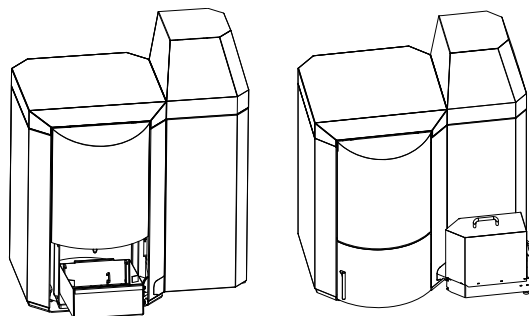
MEco offers the Pellet boiler with the following power ratings:

Suction-feed systems: 41,000; 51,000; 68,300; 85,300; 109,500; 123,000; 164,000 and 191,000 BTU/hr

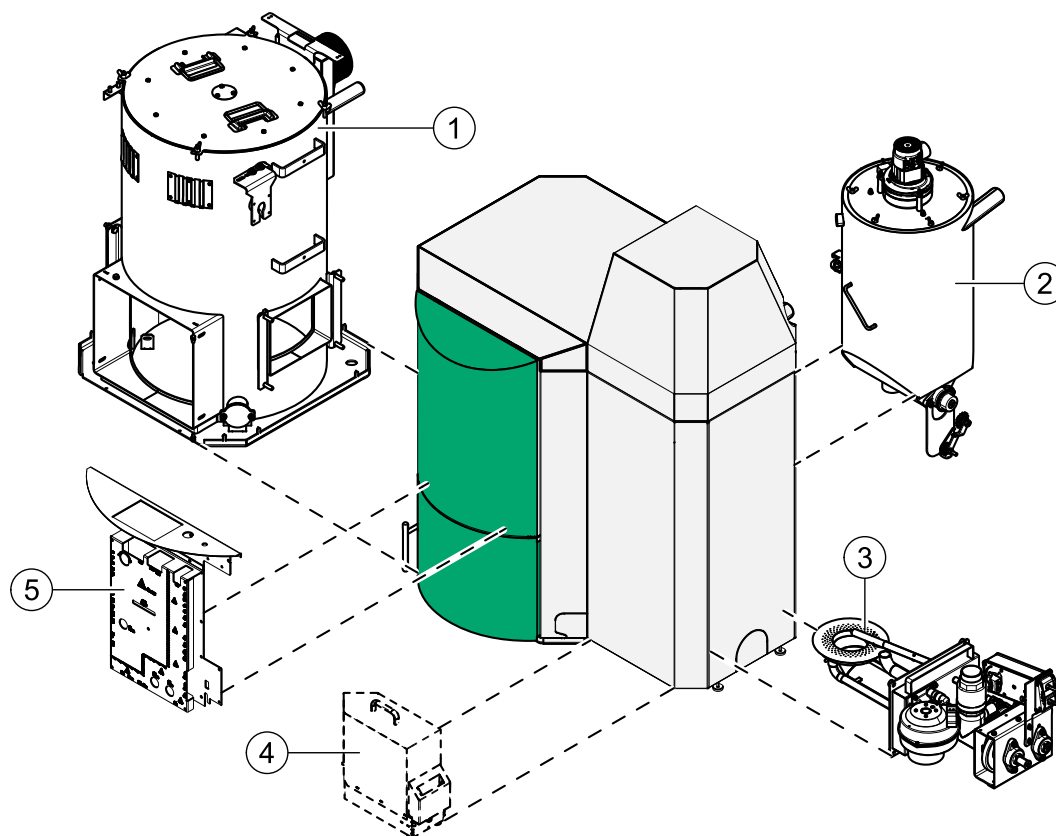
All power rating types are available with an external ash box with automatic de-ashing system.

#### Note

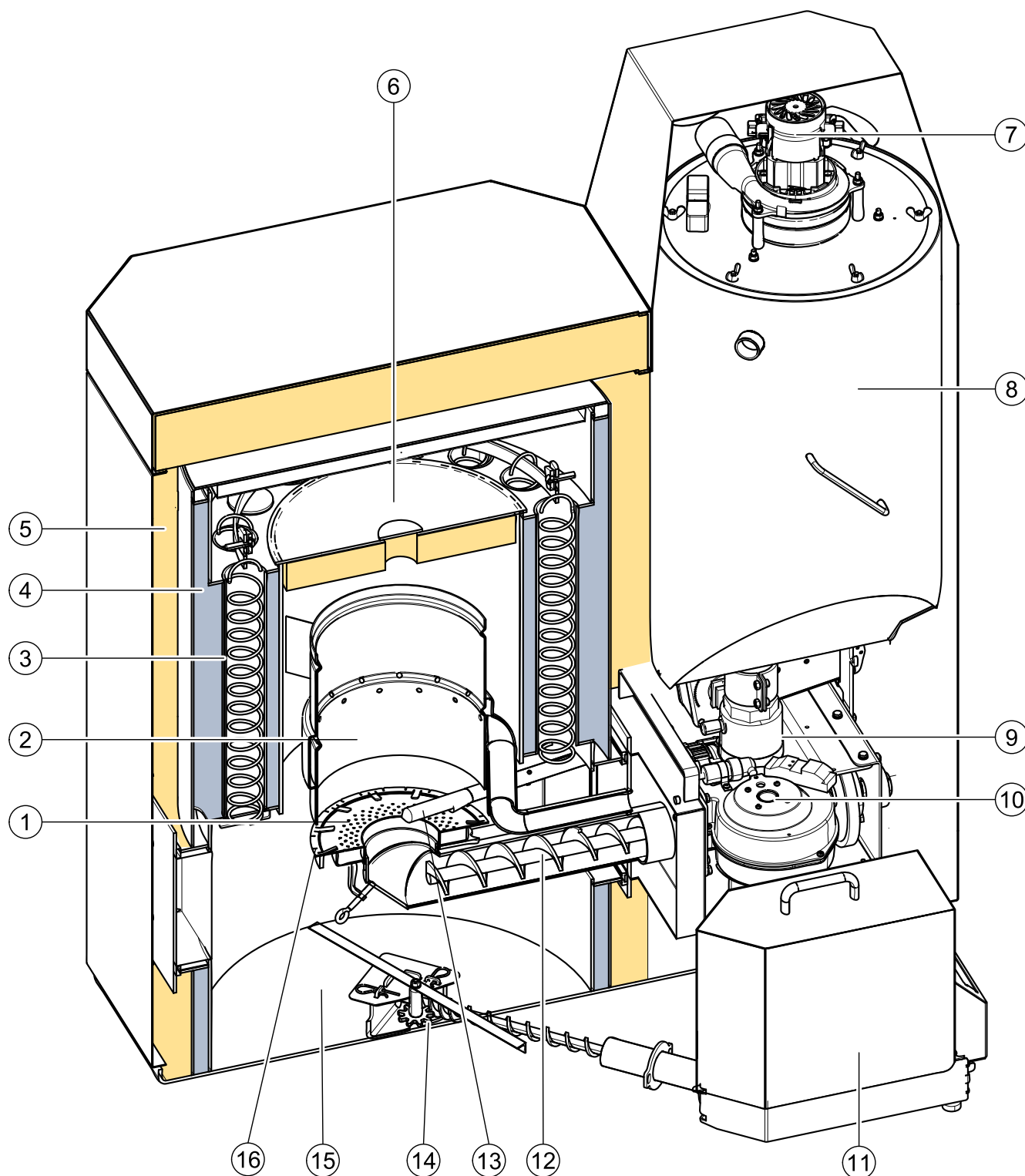
Refer to the data plate for the power rating of your Pellematic. The data plate is located on the rear side of the Pellematic. Here you will find the type designation, manufacturer's serial number and year of build.



### Key components of the Pellematic



1	Boiler (heat exchanger)
2	Hopper
3	Burner
4	External ash box
5	Boiler controller



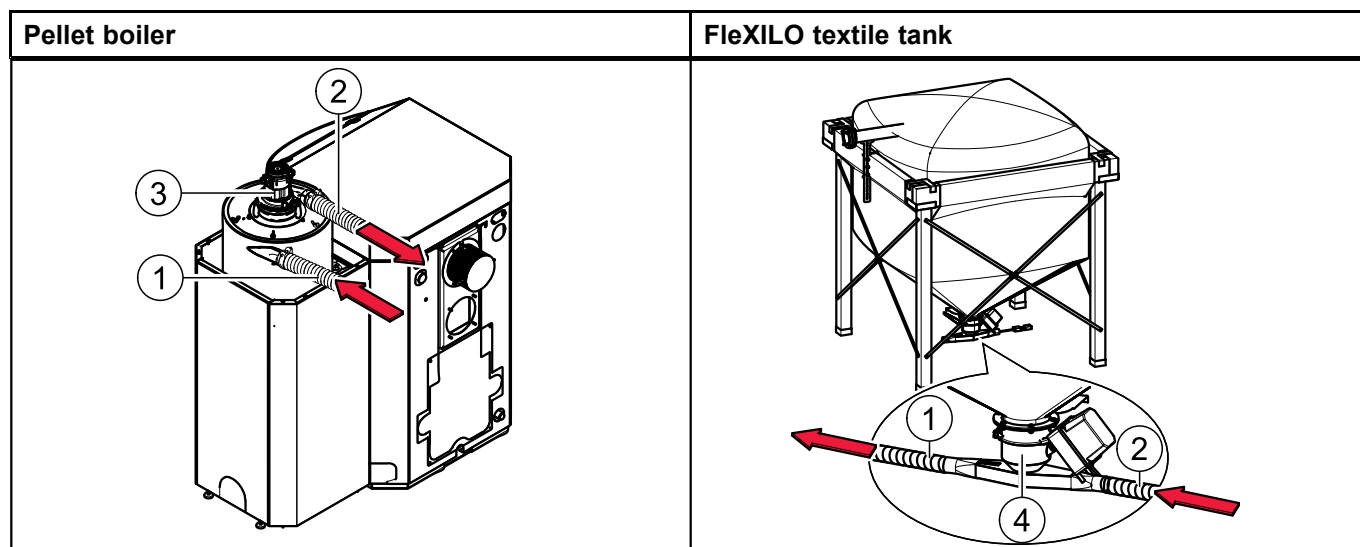
1	Burner plate	9	Fire protection – ball valve
2	Flame tube	10	Burner fan
3	Heat exchanger	11	External ash box
4	Boiler water	12	Burner auger
5	Boiler insulation	13	Electronic ignition
6	Combustion chamber cover	14	De-ashing system
7	Suction turbine	15	Ash chamber
8	Hopper	16	Burner plate cleaning system

## 6.2 Pellet suction system

The pellet suction system consists of a pellet line, an air line and a suction turbine. The suction turbine in the hopper conveys pellets in the pellet line from the storage room or textile tank to the hopper.

### Key components of pellet suction system

1	Pellet hose	Hose from textile tank to the hopper.
2	Air hose	Hosee from the suction turbine to the textile tank.
3	Suction turbine	Located above the hopper underneath the Pellematic burner casing.
4	Suction switch	Located underneath the textile tank.



### 6.2.1 Assembly of the vacuum system

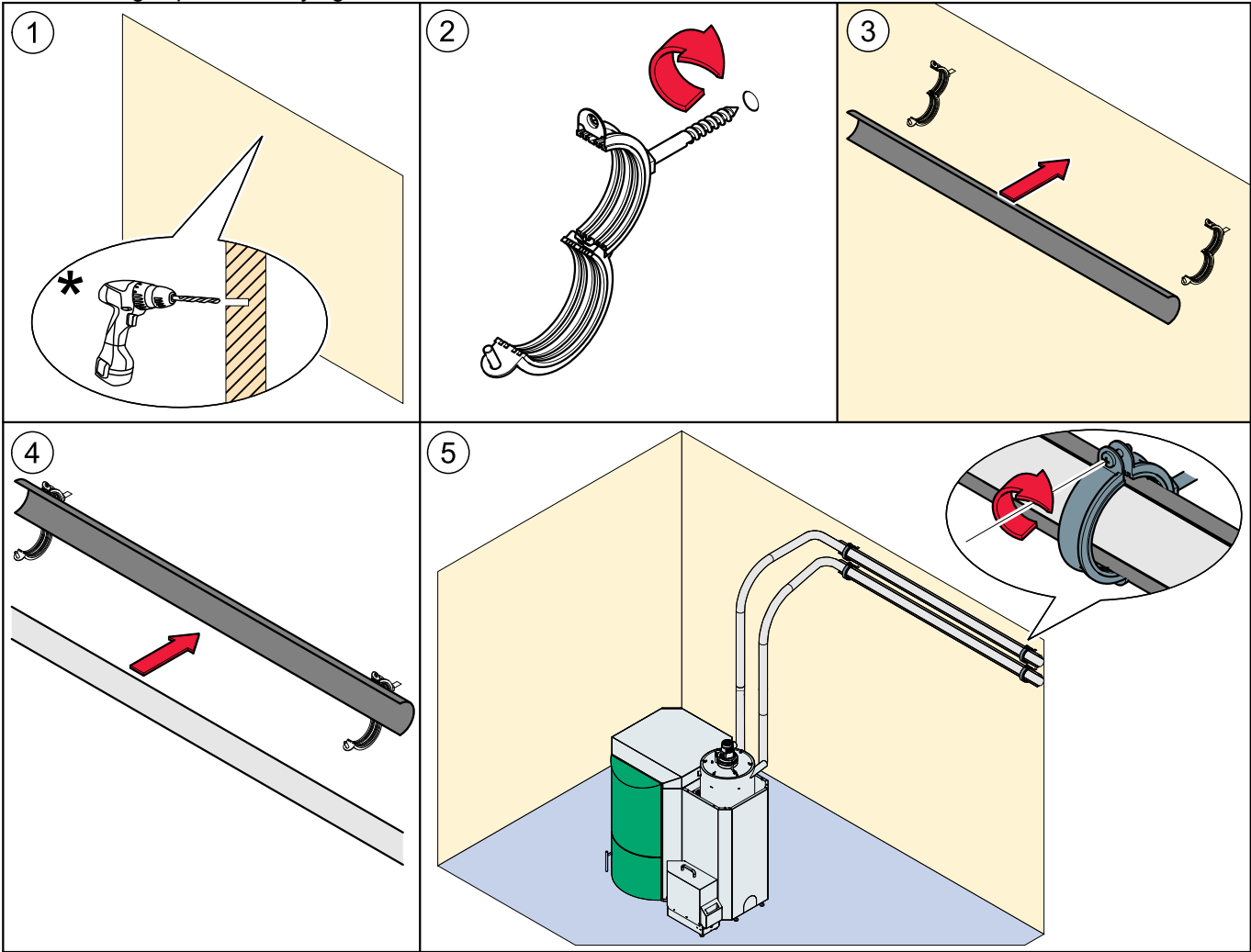
The pellet hose and the air hose are flexible spiral hoses made out of plastic. A copper braid avoids the static loading of the spiral hose.

#### Assembly guidelines

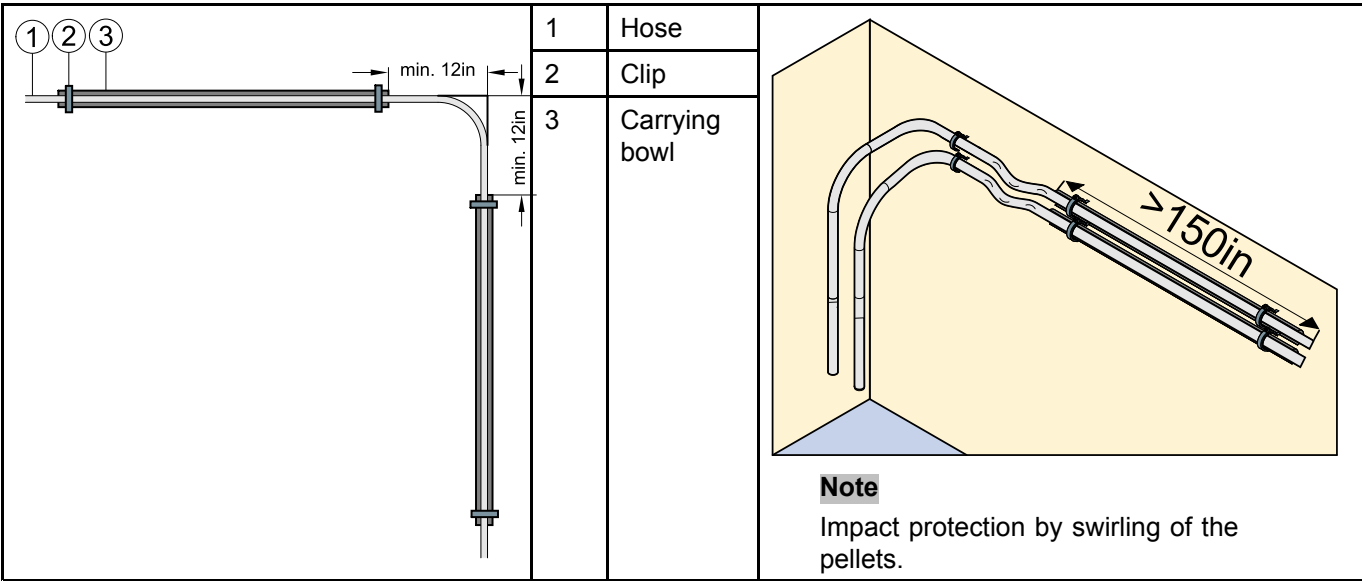
<b>Bending radius</b>	The hose should be led as briefly as possible and with a few curves as necessarily. Bending radius may never be smaller than <b>12inch</b> .
<b>Upward gradients</b>	Max difference in height = <b>236inch</b> <b>Note</b> A difference in height of up to 118inch can be overcome at one time. Larger differences in height must be interrupted with a minimum 40inch long crossbar.
<b>Tightness</b>	In order to keep problem-free a sucking of the pellets, an absolute tightness in the system must be respected. All connection points must be provided with a hose clip.
<b>Potenzial-equalization</b>	The hoses are provided with a copper braid, those the hose keeps antistatic. In order to ensure the function of the anti-statics, those copper braid must be attached at each end to the existing grounding become.
<b>Fire protection</b>	At a wall break-through to the heating room must be installed a fire protection seal in the pellet- and the air hose.
<b>Crossing</b>	Please make sure please that you cross the hoses as few as possible.
<b>Length of the spiral hose</b>	The maximum length of the spiral hose is 1570inch. The maximum for pellets hose and air hose are 755inch.

Assembly

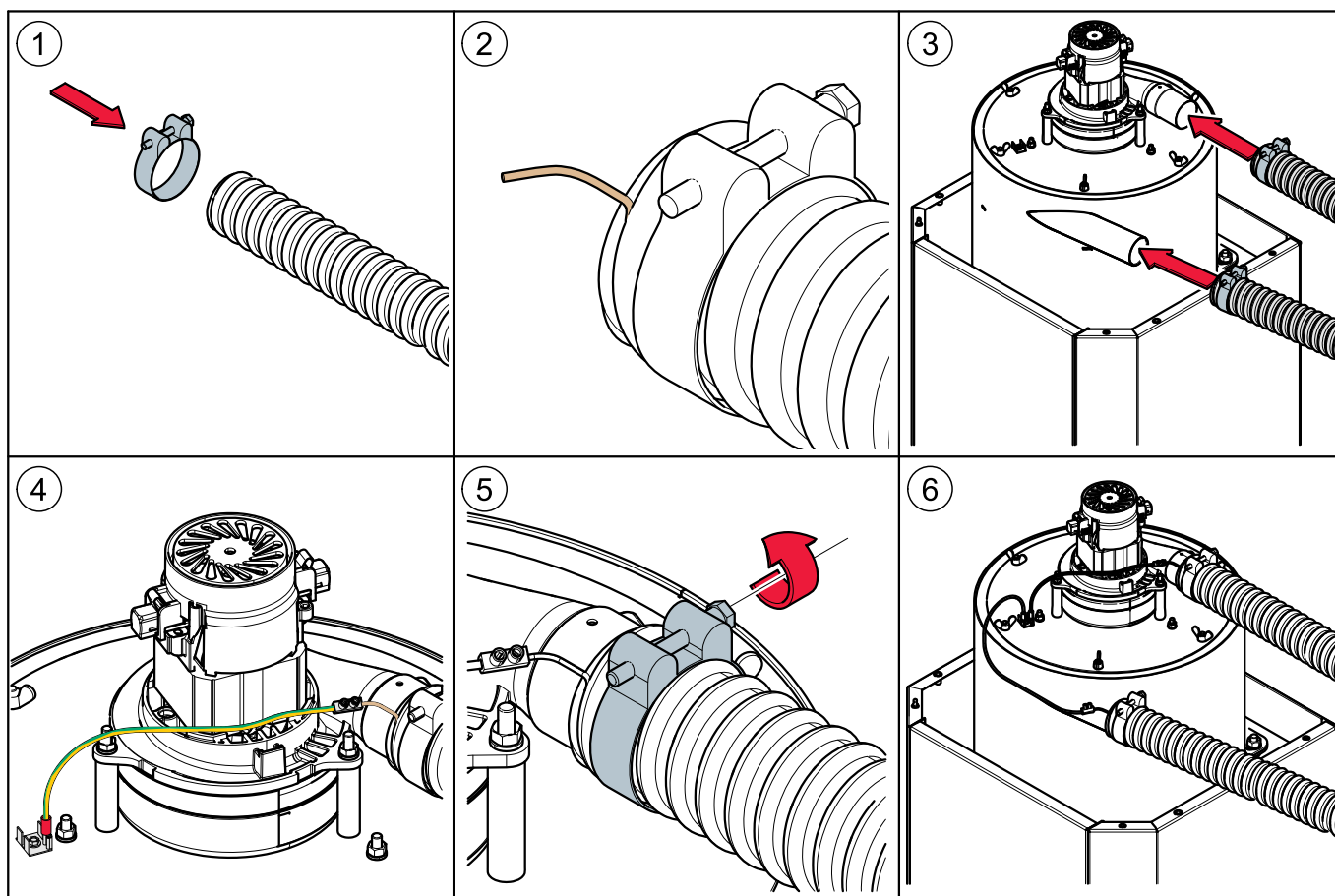
Use securing clips and carrying bowls.



\*Pay attention to the defined distances!



### Connection of the pellet and air hose to the suction turbine



## 6.3 Storage systems

For storing pellets MEco offers a FlexILO textile tank. FlexILO textile tanks can be located inside the boiler room, storage room or protected from wet and sun outside.

### NOTICE

#### Damage to property and loss of warranty

The combination of an MEco pellet boiler with a storage and conveyor system from another manufacturer has to be permitted by Meco.

#### 6.3.1 FlexILO textile tank

The whole textile tank system is included in the scope of supply. MEco offers various sizes and types. The textile tank supplied may vary from the example shown above.

Please refer to the installation instructions supplied for the textile tank. Note also the instructions on setting up and filling.

## 7 Bringing the pellet boiler into the boiler room

This section describes the prerequisites as well as the working sequence required.

1. Transport
2. Notes on bringing the unit into the building
3. Casing parts
4. Dismantling the casing parts

### 7.1 Transport

MEco supplies the pellet boiler on a pallet. The pellet boiler is ready to be connected up.

The control unit for the boiler controller and the operating device is integrated into the control panel.

The ash box and the optional external ash box with de-ashing system and the flue tube connections are supplied in separate packages. These need to be installed on-site.

If it is not possible to bring the boiler into the building at ground level, then you can remove the casing, the burner, the hopper and the boiler controller. This will reduce the weight of the unit and make it easier to carry.

### NOTICE

#### Contamination and corrosion

Make sure that the pellet boiler is located under a roof if it needs to be stored outside before it is transported/brought into the building.

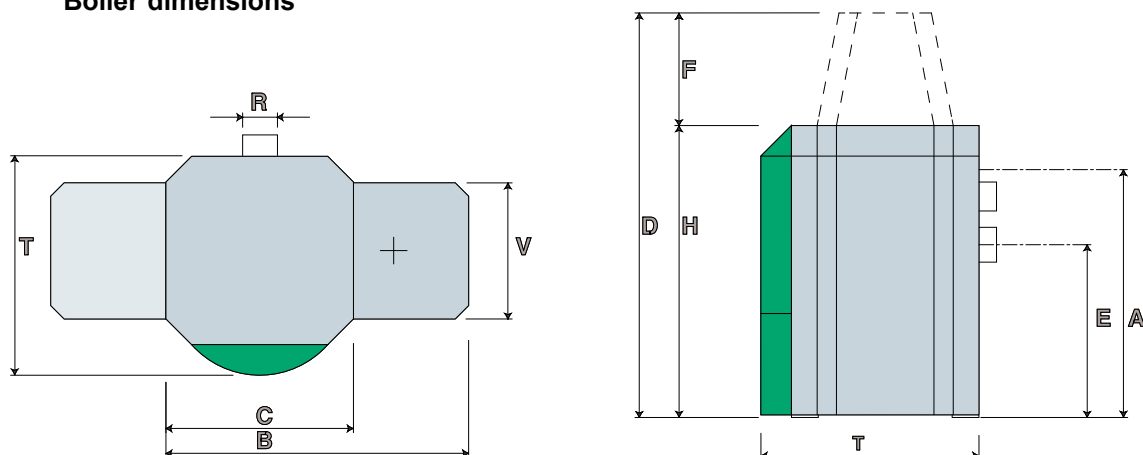
### 7.2 Notes on bringing the unit into the building

Before bringing the unit into the building, check the dimensions of all doors to ensure that the boiler has sufficient clearance and can be set up properly.

#### Minimum door width — max. unit dimension

PE, PES	12, 15, 20	27 1/2 inch
PE, PES	25, 32	29 3/4 inch
PES	36, 48, 56	31 1/8 inch

#### Boiler dimensions





Boiler size		PE(S) 12	PE(S) 15	PE(S) 20	PE(S) 25	PE(S) 32	PE(S) 36	PE(S) 48	PE(S) 56
<b>B</b> – Overall width of pellet boiler	in	44 1/2	44 1/2	44 1/2	46 3/4	46 3/4	51	51	51
<b>C</b> – Width of boiler casing	in	27 1/2	27 1/2	27 1/2	29 3/4	29 3/4	34	34	34
<b>H</b> – Height of boiler casing	in	43	43	43	51	51	61	61	61
<b>D</b> – Height of pellet suction system	in	55	55	55	63	63	73	73	73
<b>F</b> – Height of suction filling unit	in	12	12	12	12	12	12	12	12
<b>T</b> – Depth of boiler casing	in	32	32	32	34 1/4	34 1/4	39	39	39
<b>V</b> – Depth of burner casing	in	20	20	20	20	20	20	20	20
<b>E</b> – Flue gas tube connection height	in	25 1/2	25 1/2	25 1/2	33 1/4	33 1/4	41	41	41
<b>A</b> – Height of suply/return	in	35 3/4	35 3/4	35 3/4	43 3/4	43 3/4	52	52	52
<b>R</b> – Diameter of flue gas tube	in	5	5	5	6	6	7	7	7

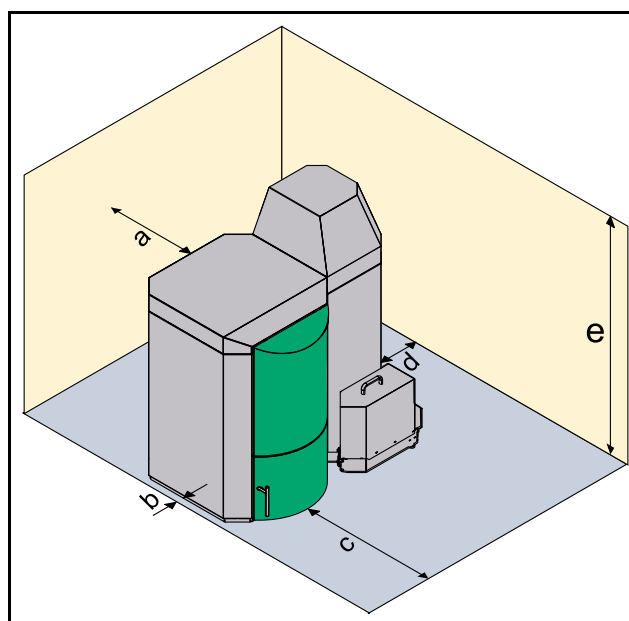
## Boiler Weight

Boiler size		PE(S) 12	PE(S) 15	PE(S) 20	PE(S) 25	PE(S) 32	PE(S) 36	PE(S) 48	PE(S) 56
Weight of boiler packaged on pallet with wooden frame	Lb	858	858	858	1003	1003	1430	1430	1430
Weight of boiler with casing, hopper and burner	Lb	631	631	631	756	756	1120	1120	1120
Weight of boiler without casing, hopper and burner	Lb	529	529	529	664	664	930	930	930

## Minimum clearance dimensions required

### Note

To install the heating system properly and ensure economical operation, you need to make sure that minimum clearance dimensions indicated below are observed when setting up the boiler. **In addition, make sure that legislation in your country is complied with relating to the minimum clearance of the flue gas tube.**



<b>a</b>	Min. clearance of flue gas connection	inch	18
<b>b</b>	Min. clearance of side of boiler	inch	5
<b>c</b>	Min. clearance of front of boiler	inch	28
<b>d</b>	Min. clearance of side of burner	inch	12
<b>e</b>	Min. ceiling height	inch	73

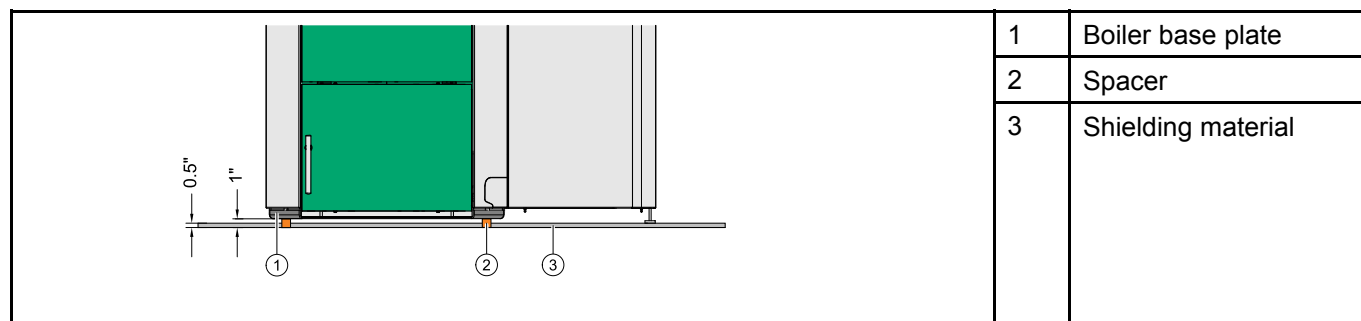
### Note

Place the boiler according to the minimum clearances to the flue tube connection piece as defined in NFPA 31 (distance of 18"). Make sure that you also comply with local legal regulations. For clearances required for floor protection, see following page.

## 7.3 Flooring

The boiler base or foundation must be perfectly flat and level and must be able to support boiler gross weight. The floor must comply with the requirements of NFPA 31

Generally the boiler should be placed on non-combustible floors. However, a shielding material can be placed underneath the boiler and the chimney connector in the case of a combustible floor like shown on the following drawing.



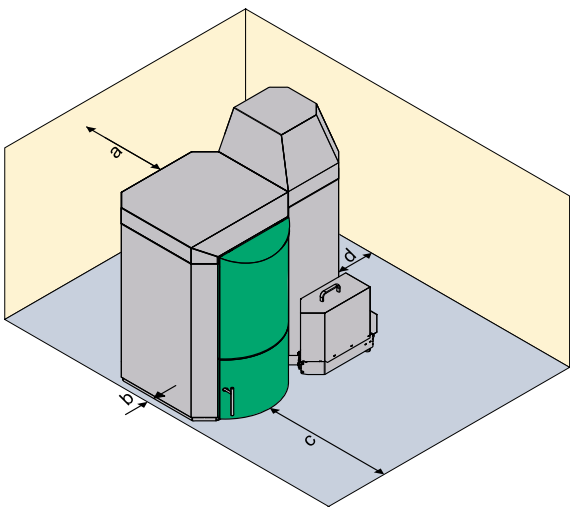
The spacer must be able to support the weight of the boiler and has to be non combustible. The shielding material must be equivalent to a ½" micro board with a K-value of 0.49 (W/m K) (R-value of 1.02 K m2/W) or greater. For detailed material specifications and offering contact your MEco technician!



## DANGER

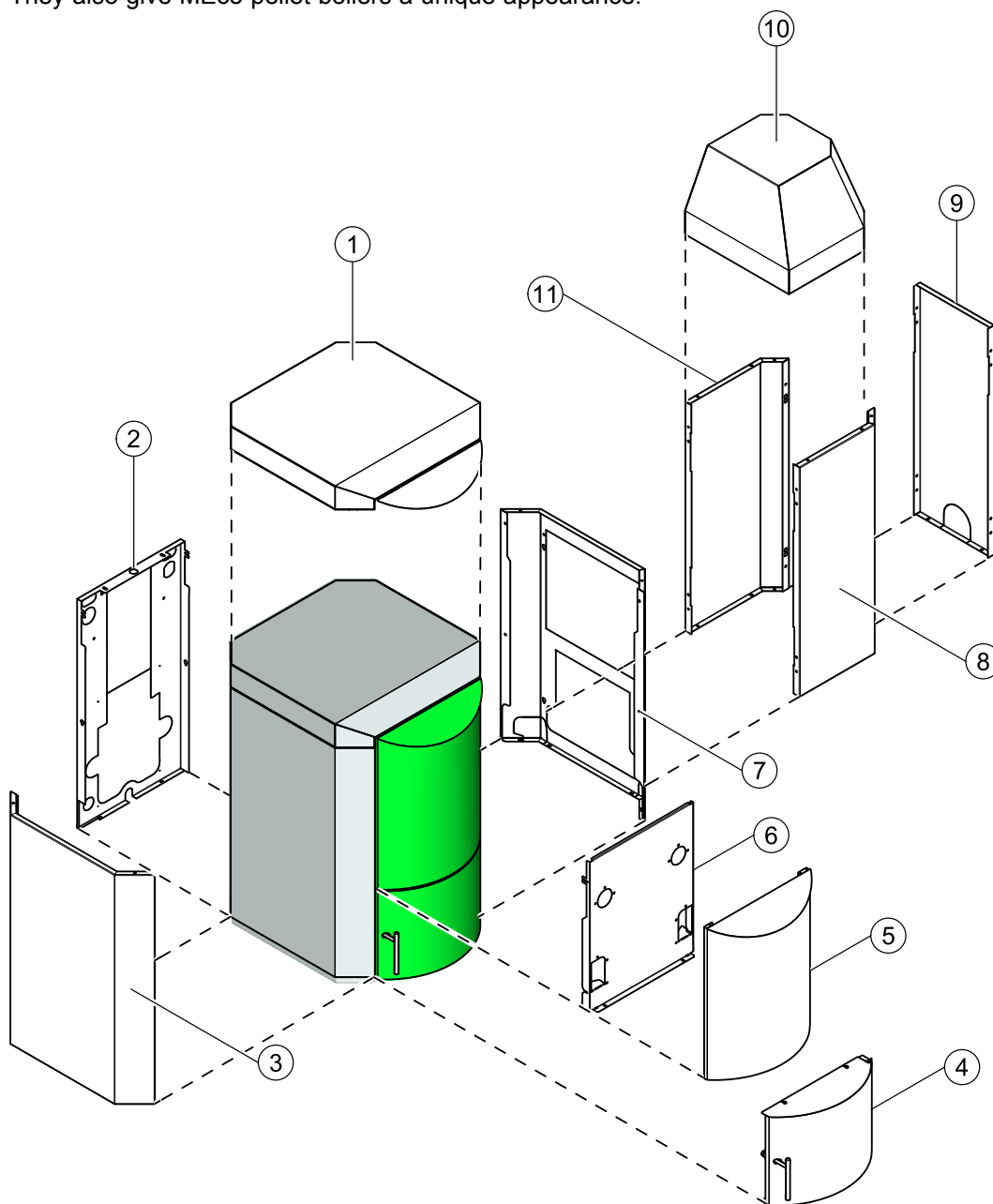
### Risk of fire

The flooring needs to extend out to the clearances on the chart below.

	Minimum clearances of shielding material required for floor protection		
	Min. clearance of the shielding material from the boiler back – Note also the local restrictions in your area (a)	inch	4
	Min. clearance of the shielding material from the boilers left side panel (b)	inch	8
	Min. clearance of the shielding material from the boilers front panel (c)	inch	16
	Min. clearance of the shielding material from the boilers right side panel (d)	inch	8

## 7.4 Casing parts

The boiler is protected by a casing on all sides. The casing parts prevent contact with hot, moving and live components. They also give MEco pellet boilers a unique appearance.



1	Boiler casing cover	7	Boiler side panel with opening
2	Boiler rear panel	8	Burner side panel (same as 11)
3	Boiler side panel without opening	9	Burner lug without opening
4	Boiler door panel (semi-circle)	10	Burner cover suction system
5	Boiler front panel (semi-circle)	11	Burner side panel (same as 8)
6	Boiler front panel (straight)		

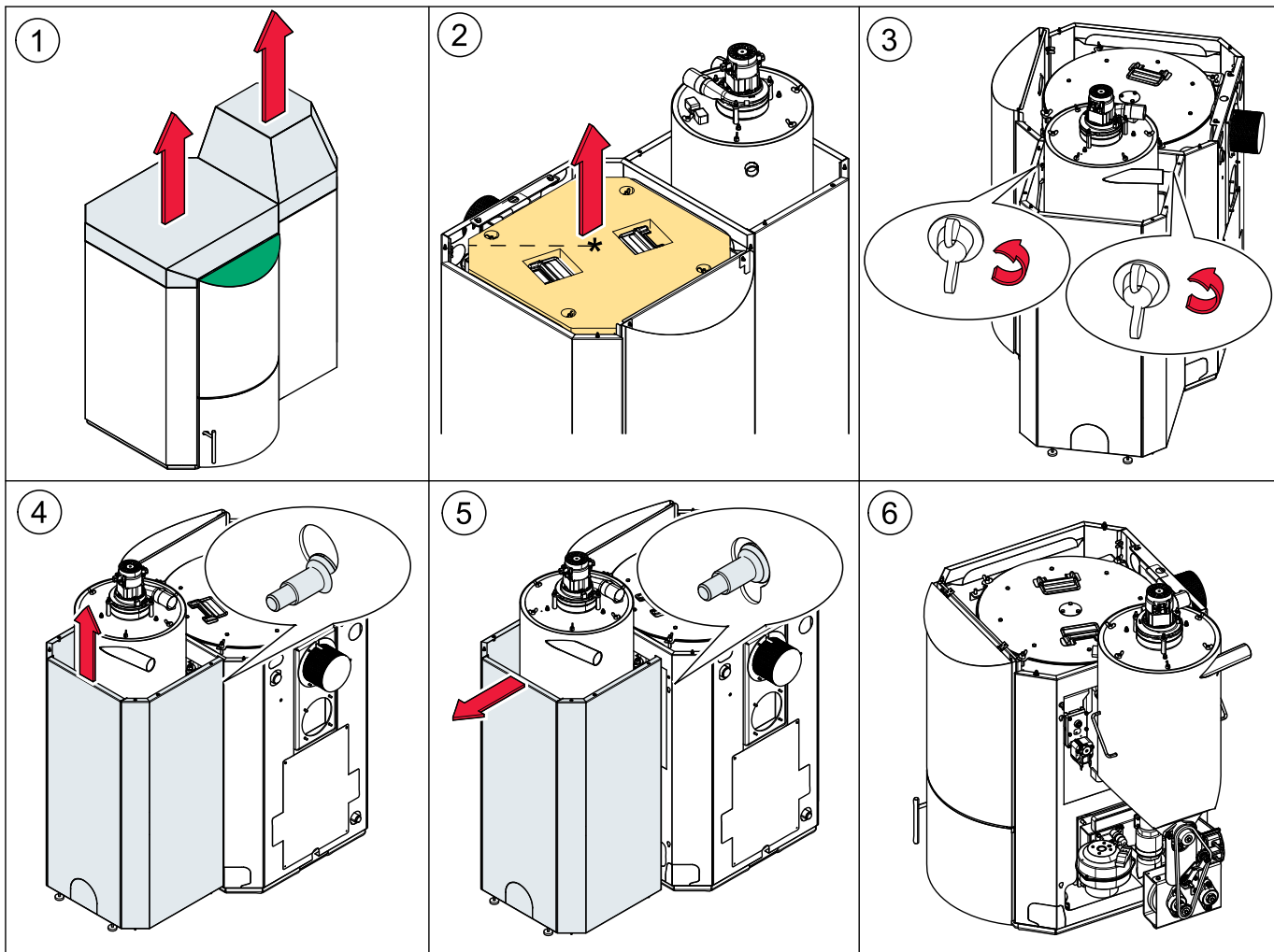
## 7.5 Removing the casing, the hopper and the burner

Dismantle the pellet boiler as far as necessary if site conditions require, so that the unit can be brought safely into the building.

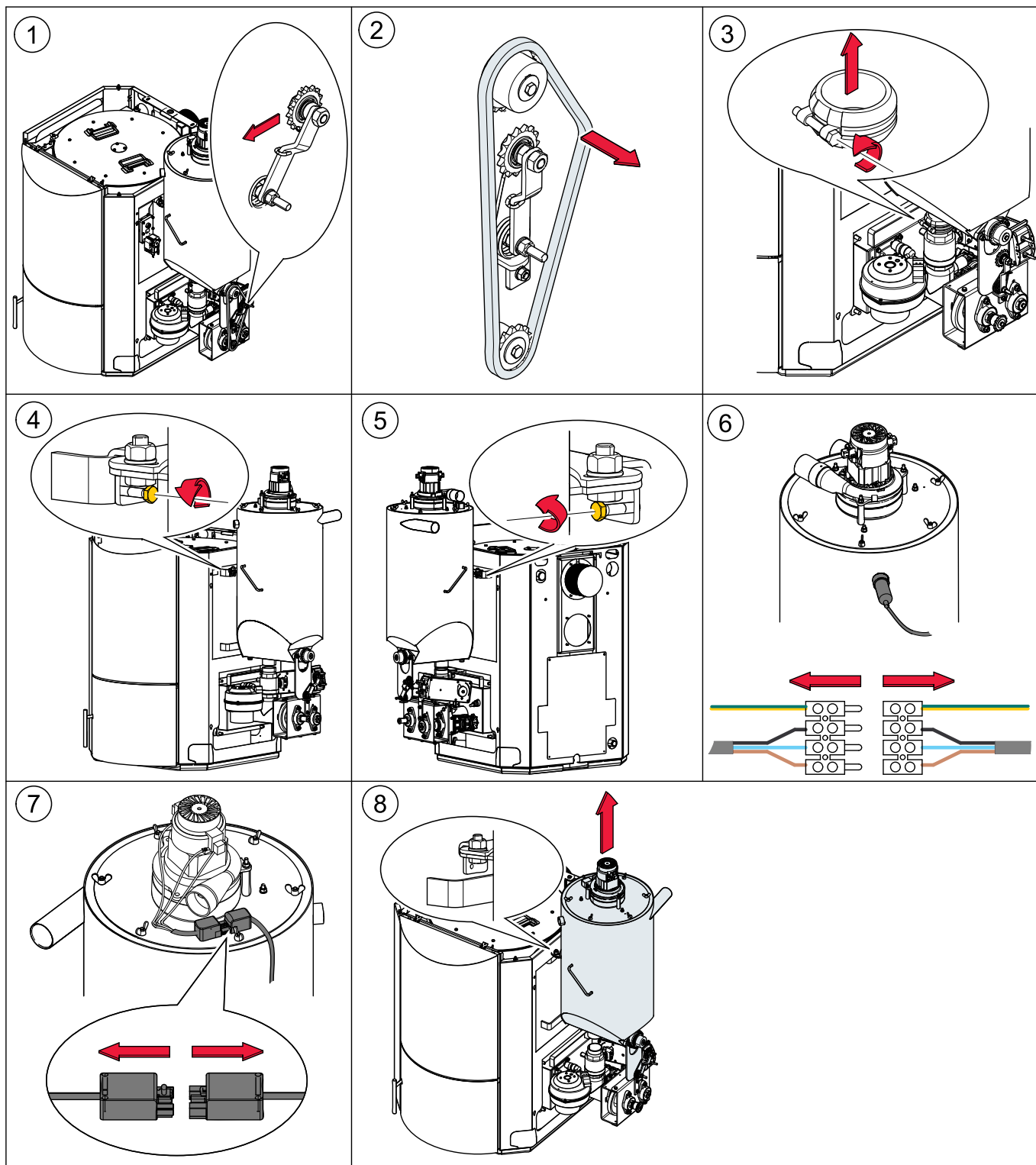
The complete dismantling of all components described here is divided into the following sections:

1. Dismantling the burner casing
2. Dismantling the hopper
3. Dismantling the burner
4. Dismantling the boiler door
5. Dismantling the boiler casing

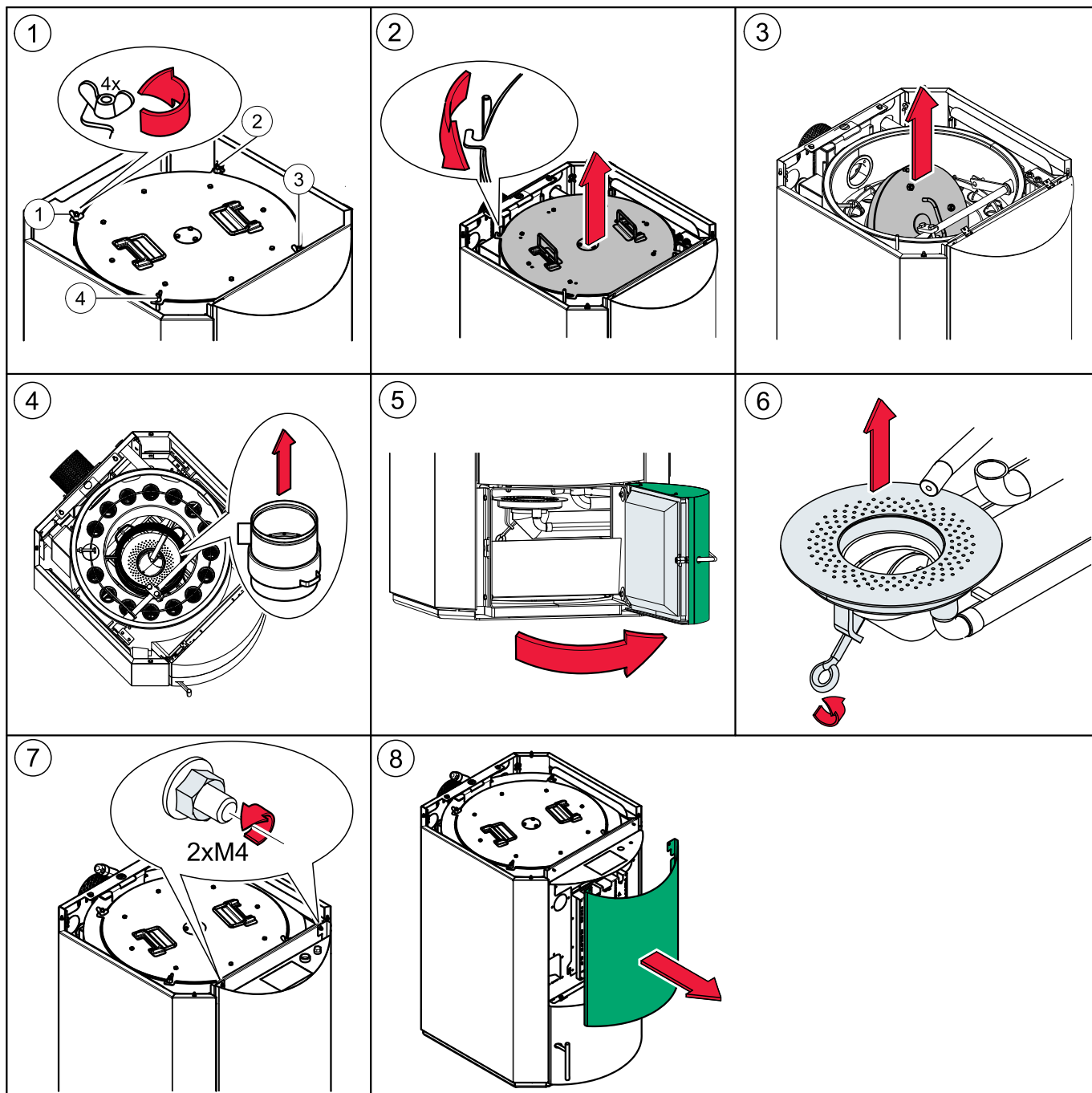
### 7.5.1 Dismantling the burner casing

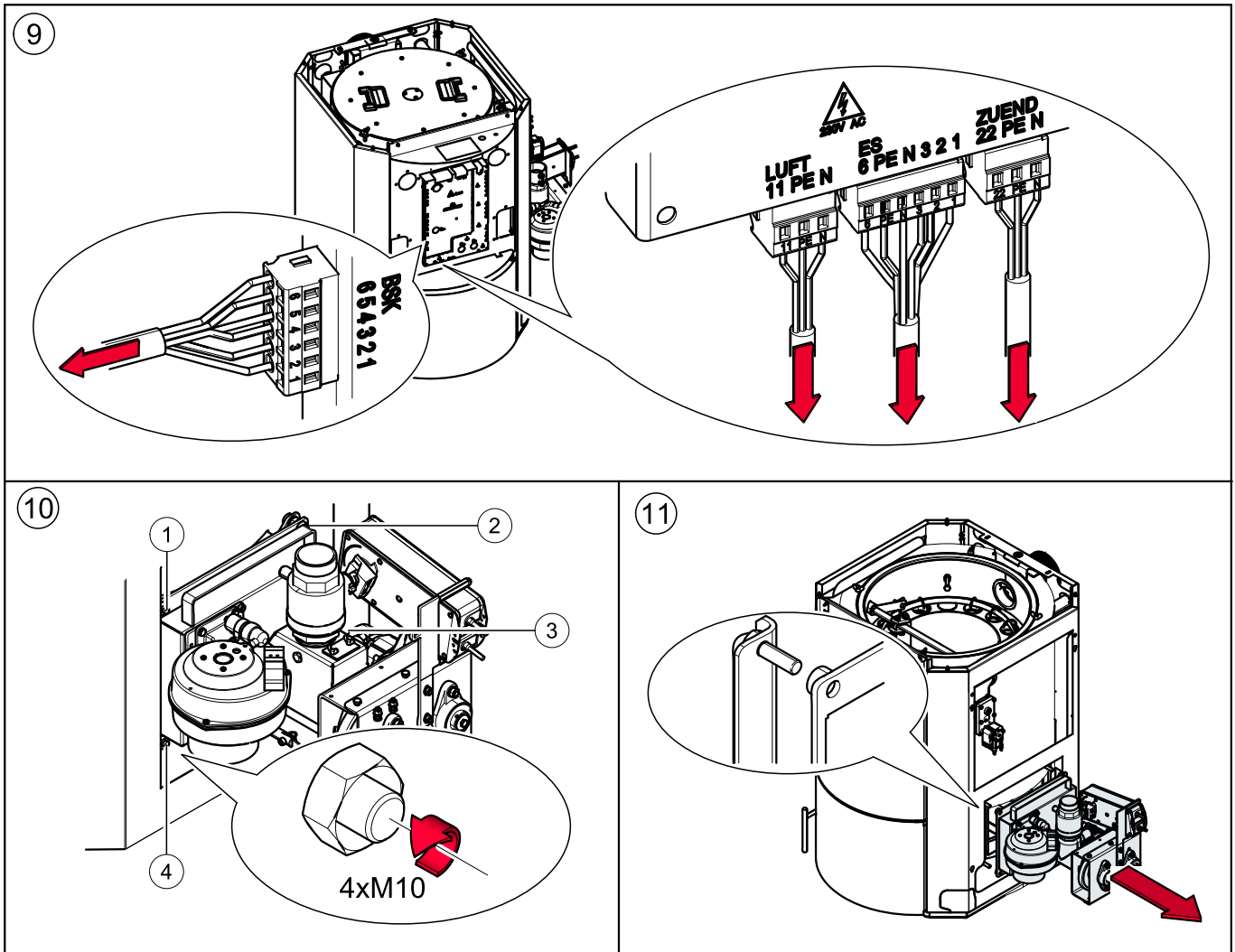


## 7.5.2 Dismantling the hopper

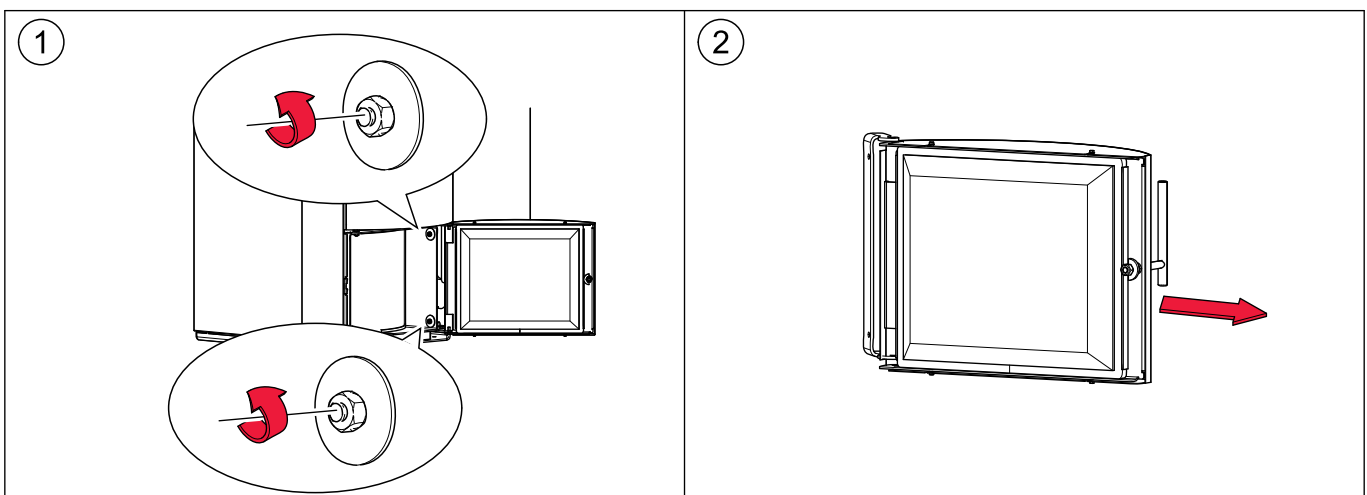


## 7.5.3 Dismantling the burner



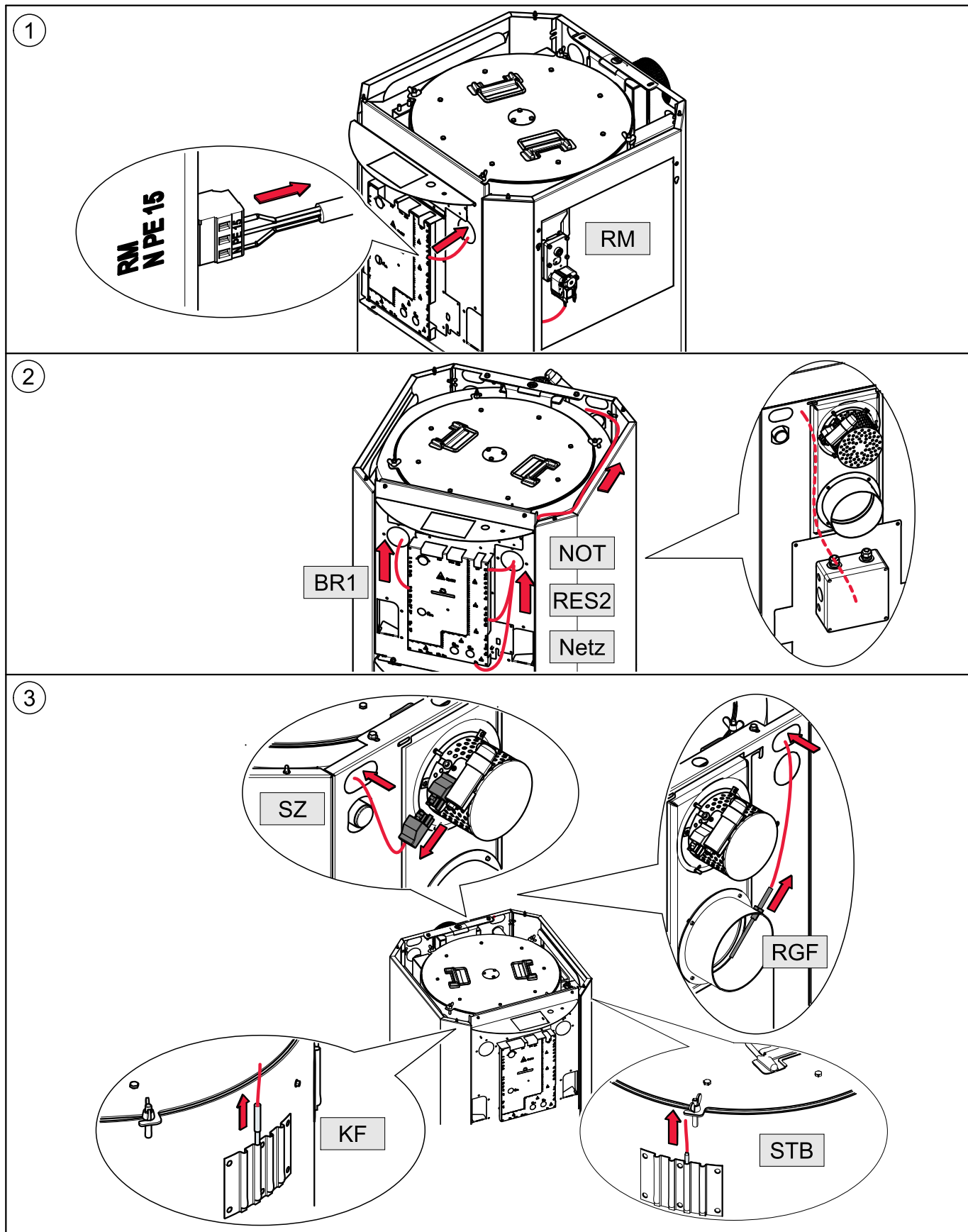


## 7.5.4 Dismantling the boiler door

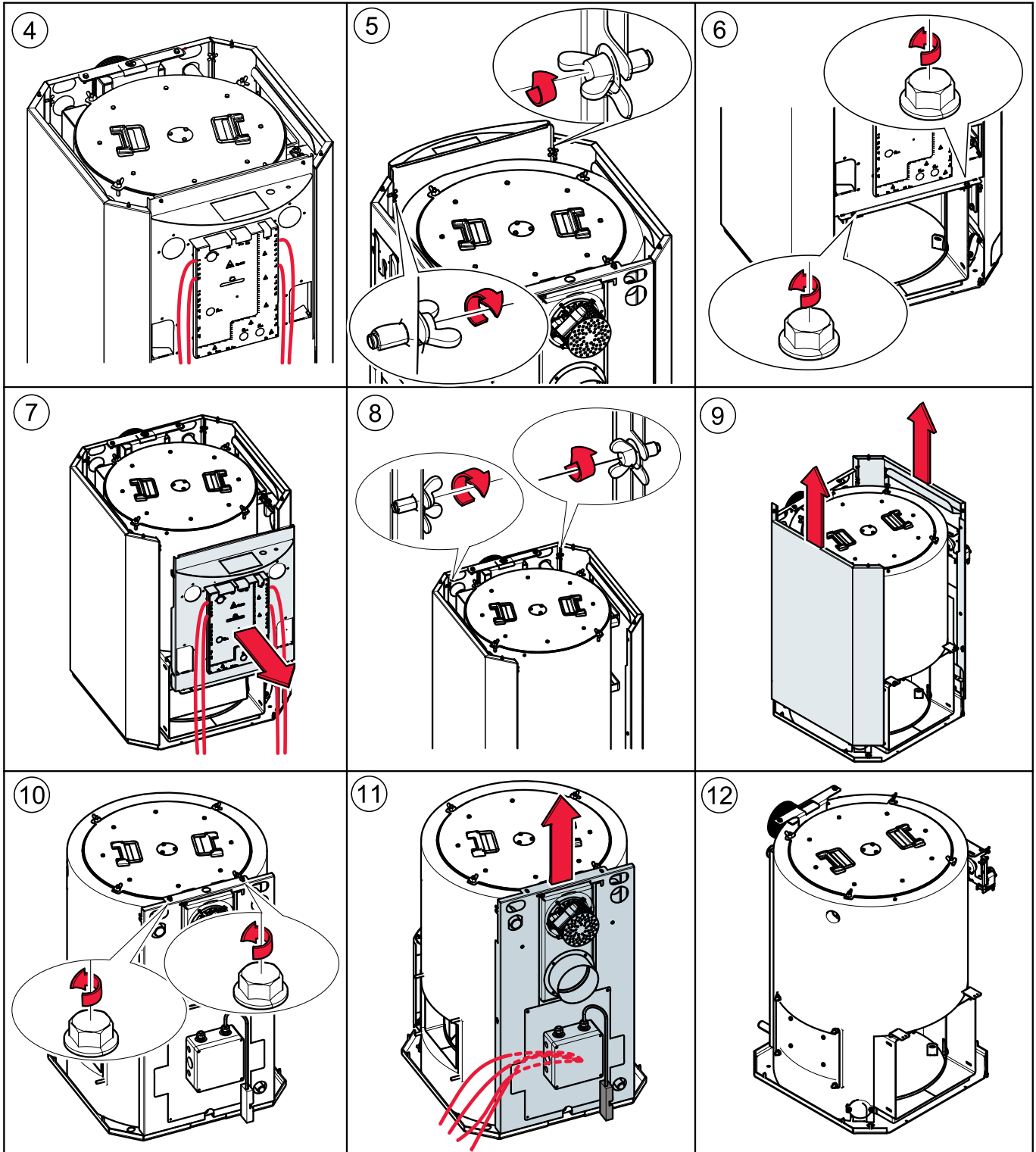




## 7.5.5 Dismantling the boiler casing







## Note

Before dismantling the rear panel burner contact–BR1, boiler controlled pump–RES 2, emergency stop heating–NOT; power supply–Netz must be disconnected and routed back. See picture number 2

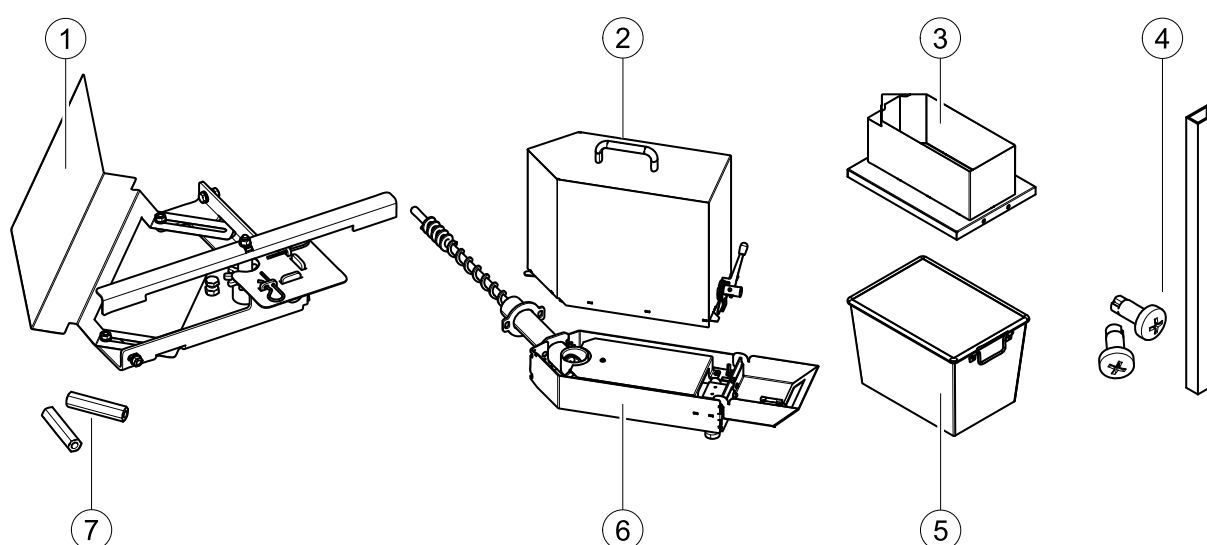
## 8 External de-ashing system

MEco offers an automatic external de-ashing system.

1. Description of de-ashing system
2. How the de-ashing system works
3. Installing the de-ashing system
4. Emptying the de-ashing system

### 8.1 Description of de-ashing system

The de-ashing system compresses the ash and conveys it from the ash chamber into the ash box. The ash box enables the ash to be easily disposed off without creating dust.



1	Turnstile with agitator, door plate and mounting bolts	5	Ash container
2	Ash box with single-hand lever	6	Sub-assembly with extractor auger and cable
3	Mounting frame	7	Extended nuts to secure the sub-assembly
4	Cable duct with mounting bolts	8	1 pack of bio-bags

#### Note

All components for the de-ashing system are packaged in a separate box which is shipped together with the boiler. Open the box and check that all parts are available before starting work.

### 8.2 How the de-ashing system works

The de-ashing system is fully automatic. A dedicated motor in the sub-assembly of the de-ashing system drives the de-ashing auger. Its function is controlled and tested by the boiler controller.

The motor in the sub-assembly of the de-ashing system drives the de-ashing auger and the turnstile agitator arm. The agitator arm conveys the ash to the de-ashing auger. The de-ashing auger conveys the ash from the ash chamber into the ash box.

When the ashbox is full then the alarm text **"Ash"** appears on the display of the boiler controller. If you do not empty the ash box, the completes a futher 3 de-ashing sequences before failing. The boiler controller then displays the alarm text **"Ash box full"**. The heating system switches off. The heating system switches back on again automatically after the ash box has been emptied.

For pellets with a very high ash content, it is necessary to extend the duration of the de-ashing process and possibly also reduce the time interval between de-ashing processes. This can be done using parameters P195 and P196.

DE-ASHING PARAMETER			FACTORY SETTINGS		
Parameter	Display on screen	Description	PE(S) 12–20	PE(S) 25–32	PES 36–56
P195	Min running time ash	Burner run time until start of next de-ashing attempt	120 min	80 min	45 min
P196	Ash comp. duration	Duration of de-ashing process	3 min	3 min	5 min

### Note

The de-ashing system compresses the ash and conveys it from the ash chamber into the ash box. How frequently you need to empty the ash box depends on pellet consumption and the ash content of the pellets.

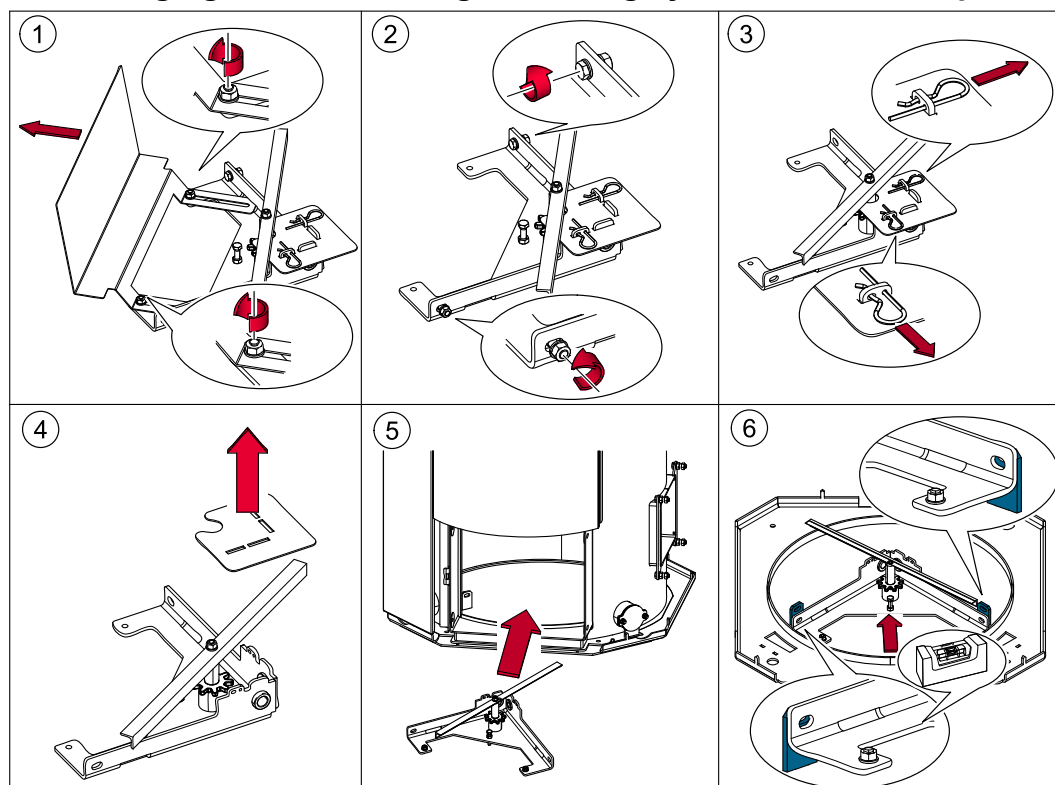
## 8.3 Installing the de-ashing system

MEco recommends installing the de-ashing system after the boiler has been brought in, but before the boiler casing is fitted. The de-ashing system has to be installed before the burner casing is assembled.

Installation of the de-ashing system is divided into the following steps:

1. Bringing in and installing the de-ashing system on the base plate
2. Installing the de-ashing auger, fitting the sub-assembly and mounting the door plate
3. Installing the burner side casing with cut-out and electrical connection
4. Assembling the pellet boiler and activating the ash box

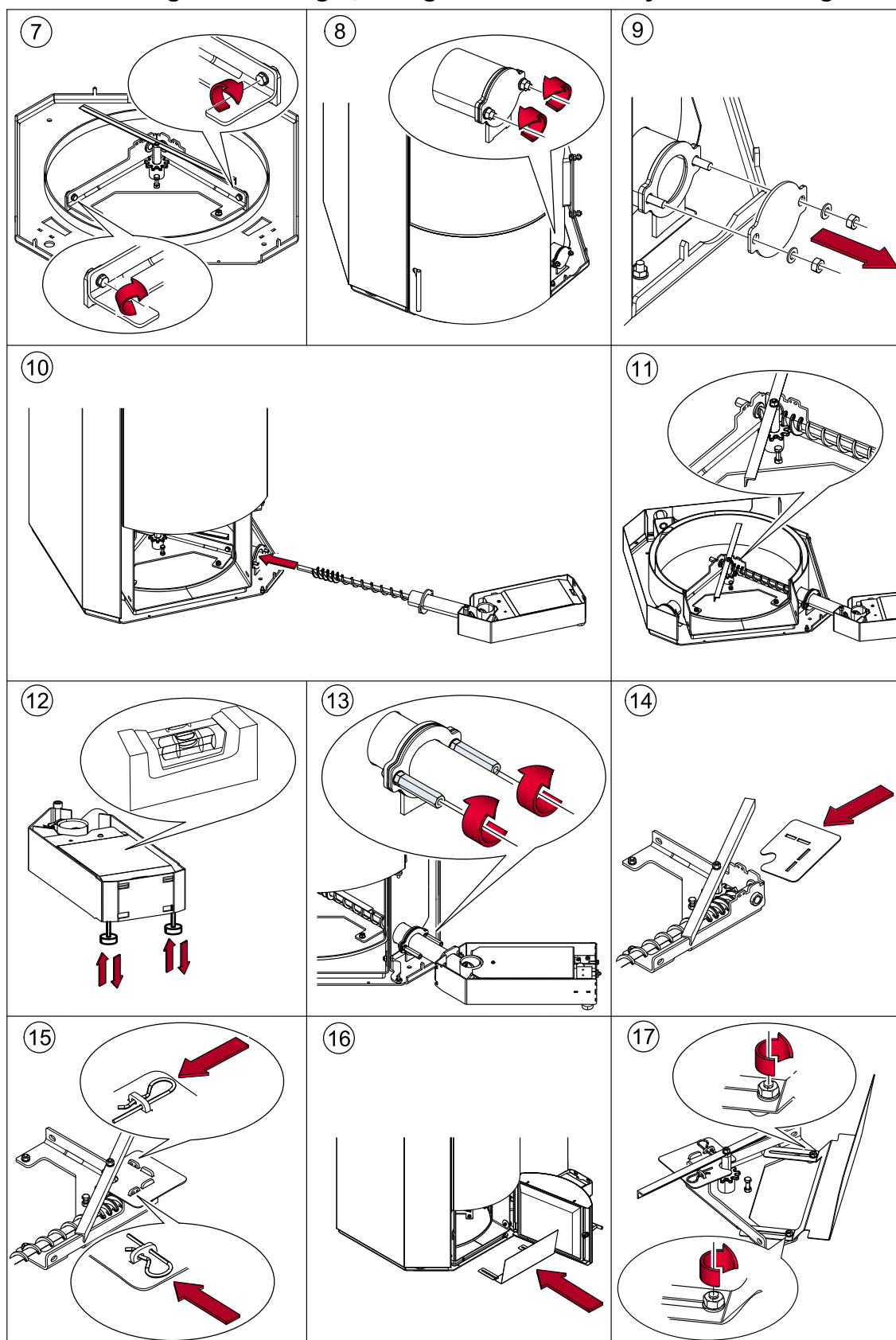
### 8.3.1 Bringing in and installing de-ashing system on the base plate



### Note

5: Replace the screw with the base in a horizontal position.

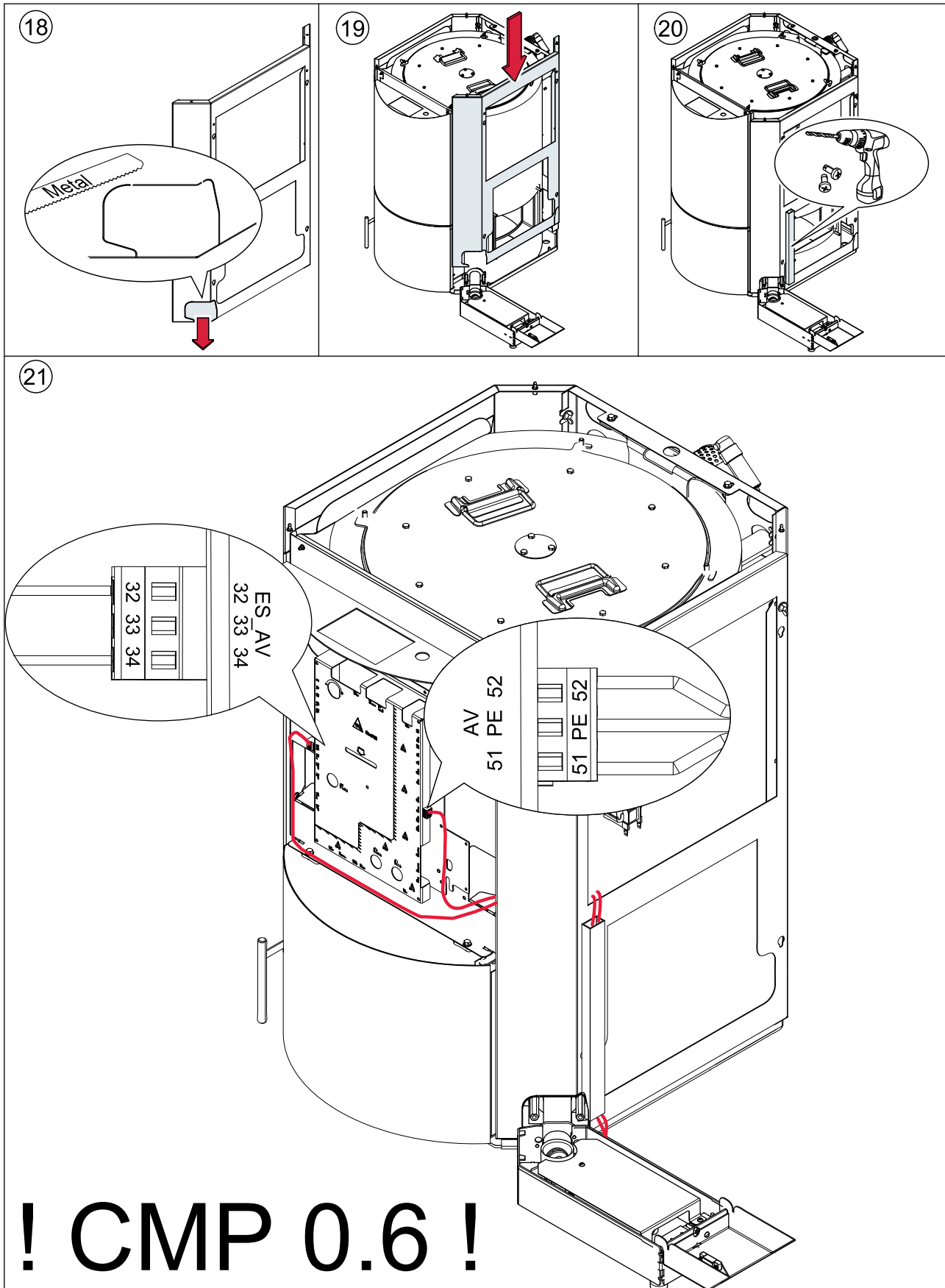
## 8.3.2 Installing the ash auger, fitting the sub-assembly and mounting the door plate



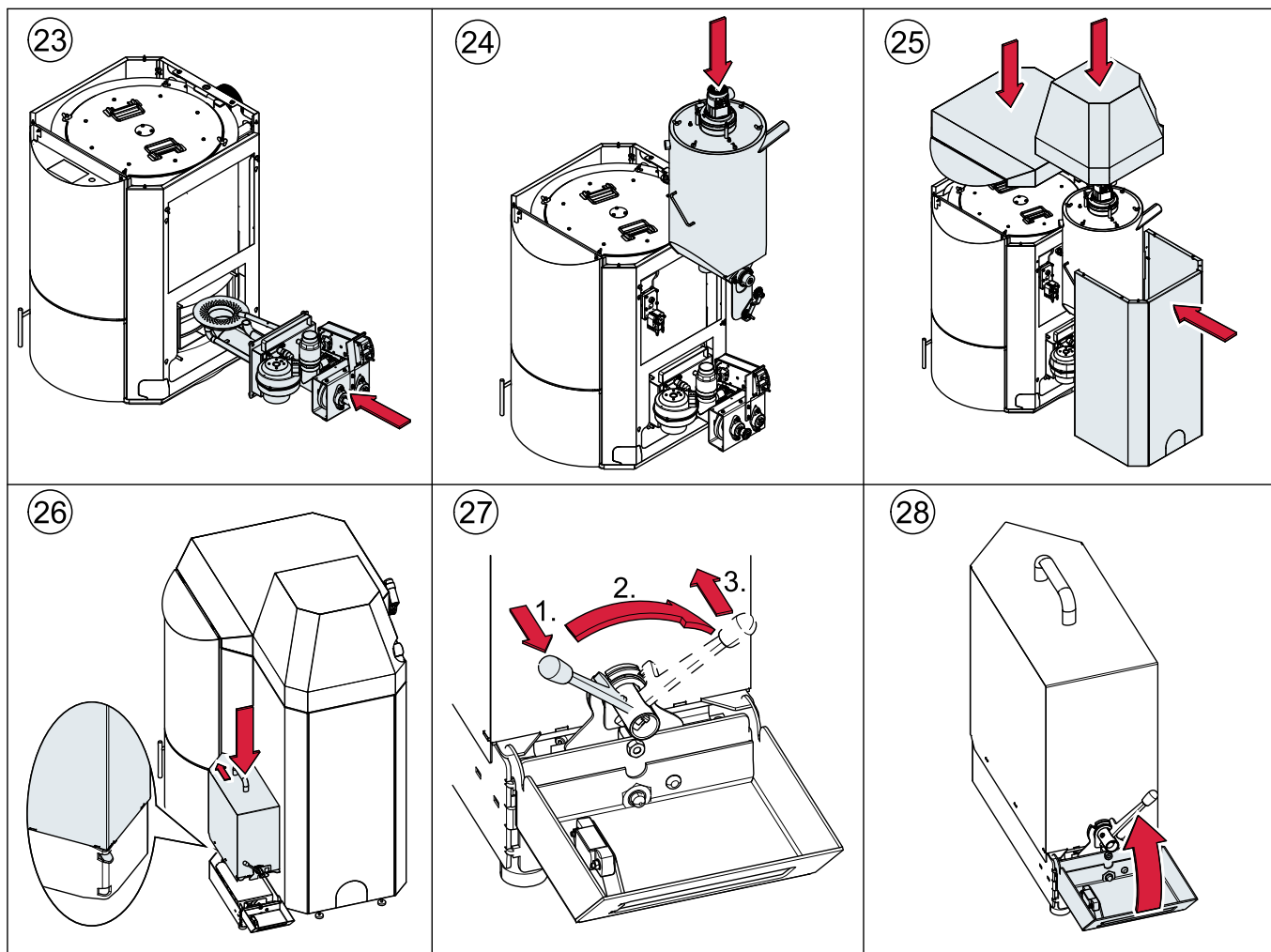
### Note

Do not tighten the screws firmly (picture 7). Tighten the screws firmly only after working step in picture 11. The ash auger engage with the gear must be so that the agitator moves freely.

### 8.3.3 Installing the burner side casing with cut-out and electrical connection



## 8.3.4 Assembling the pellet boiler and activating the ash box



### Note

Refer to the section on bringing the pellet boiler into the boiler room for detailed instructions on assembling the hopper, burner and casing components.

### Activating the ash box

1. Switch ON the boiler
2. Open the Pellematic menu at the control unit by entering the code under parameter 199 in level 200. Then go to **parameter 212: Ash box**
3. Set up the number from **0** to **1**
4. Ash box is activ

## 9 Connecting up the hydraulics

The hydraulic connections are located on the rear side of the boiler.



### DANGER

#### Risk of explosion

You may connect up the pellet boiler only after an authorised plumber has installed the hydraulic system completely with all safety devices.

### NOTICE

#### Water damage, damage to pellet boiler

Only an authorised plumber may connect up hydraulics on the pellet boiler. Check the hydraulic system for leaks before starting up.

#### 1. Return water temperature control

The device to increase the return temperature is already integrated into the boiler. You do not need to make any adjustments to this.

#### 2. Hydraulic schematics

Always refer to the MEco hydraulic schematics when connecting up the pellet boiler. The MEco hydraulic schematics are available from your MEco sales partner or from the MEco website.

#### 3. Connections

The connections between the pellet boiler and the hydraulic system must be disconnectable.

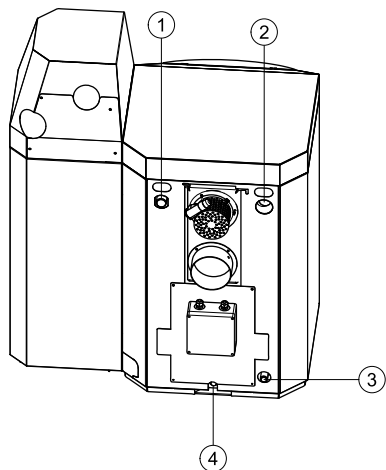
#### 4. Drain connection

When you install the pellet boiler, remove the plug from the drain connection (4) and fit a 1/2" diameter shut-off valve.

#### 5. Thermometer connection

Installing a thermometer at location (3) (submersion sleeve 3.94 in long) enables you to measure the temperature of the return water after the return water temperature control.

Whether this is installed or not, after setting up the pellet boiler you need to remove the cap and fit a 1/2" diameter closure plug at location (3).



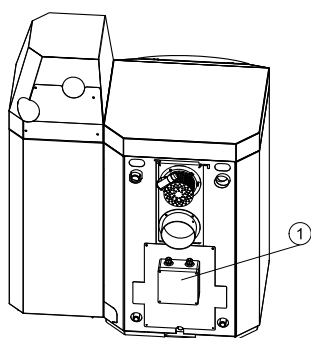
1	Flow	3	Thermometer connection
2	Return	4	Drain connection



## 10 Connecting up to the power supply

### 10.1 Terminal box

The terminal box serves for connecting up the power supply, low water cut off, curcuit pump an the summer winter switch.



1..... Terminal box

#### 10.1.1 Wiring diagram - terminal box

The wiring diagrams for the terminal box provide detailed technical information for electricians.



### DANGER

#### Electric shock

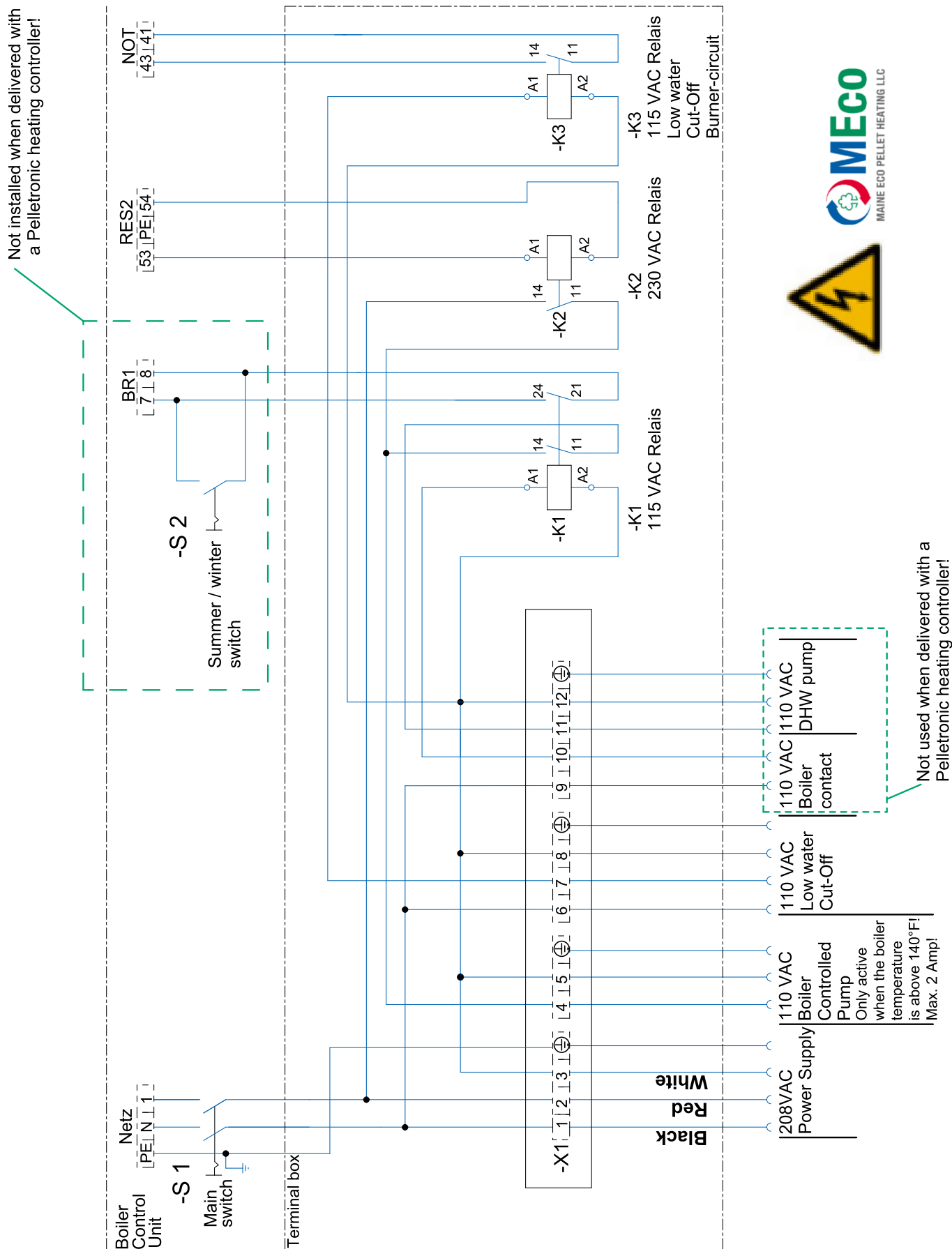
Only an authorised service technician may connect up the pellet boiler to the power supply.  
Isolate the entire heating system from the power supply before starting work on the pellet boiler.

#### General information for the electrician

- Voltage supply 208V: Supply line protection 16A
- [10.2.4 Boiler protection \(control panel\): Fuse 5x20: 10A, page 47](#)
- Lightning protection: as there is no possible complete protection against lightening, we suggest fitting a voltage spike suppressor in the building distribution system.
- **Electrical connection:**  
USA 208 VAC, 60 Hz, 6A for auger delivery system, 16A for vacuum suction system  
EU 230 VAC, 50 Hz, 6A for auger delivery system, 16A for vacuum suction system

Wiring plan	
Terminal	Specification
1	Hot wire L1 (Black) - Power Supply
2	Hot wire L2 (Red) - Power Supply
3	Neutral wire (White) - Power Supply
⊕	Ground wire - Power Supply
4	Hot wire - Boiler Controlled Pump
5	Neutral wire - Boiler Controlled Pump
⊕	Ground wire - Boiler Controlled Pump
6	Hot wire - Power Supply water Cut-Off
7	Hot wire - Burner Circuit Low water Cut-Off
8	Neutral wire - Low water Cut-Off
⊕	Ground wire - Low water Cut-Off
9	Hot wire - boiler contact
10	Hot wire - boiler contact
11	Hot wire - Domestic hot water pump
12	Neutral wire - Domestic hot water pump
⊕	Ground wire - Domestic hot water pump



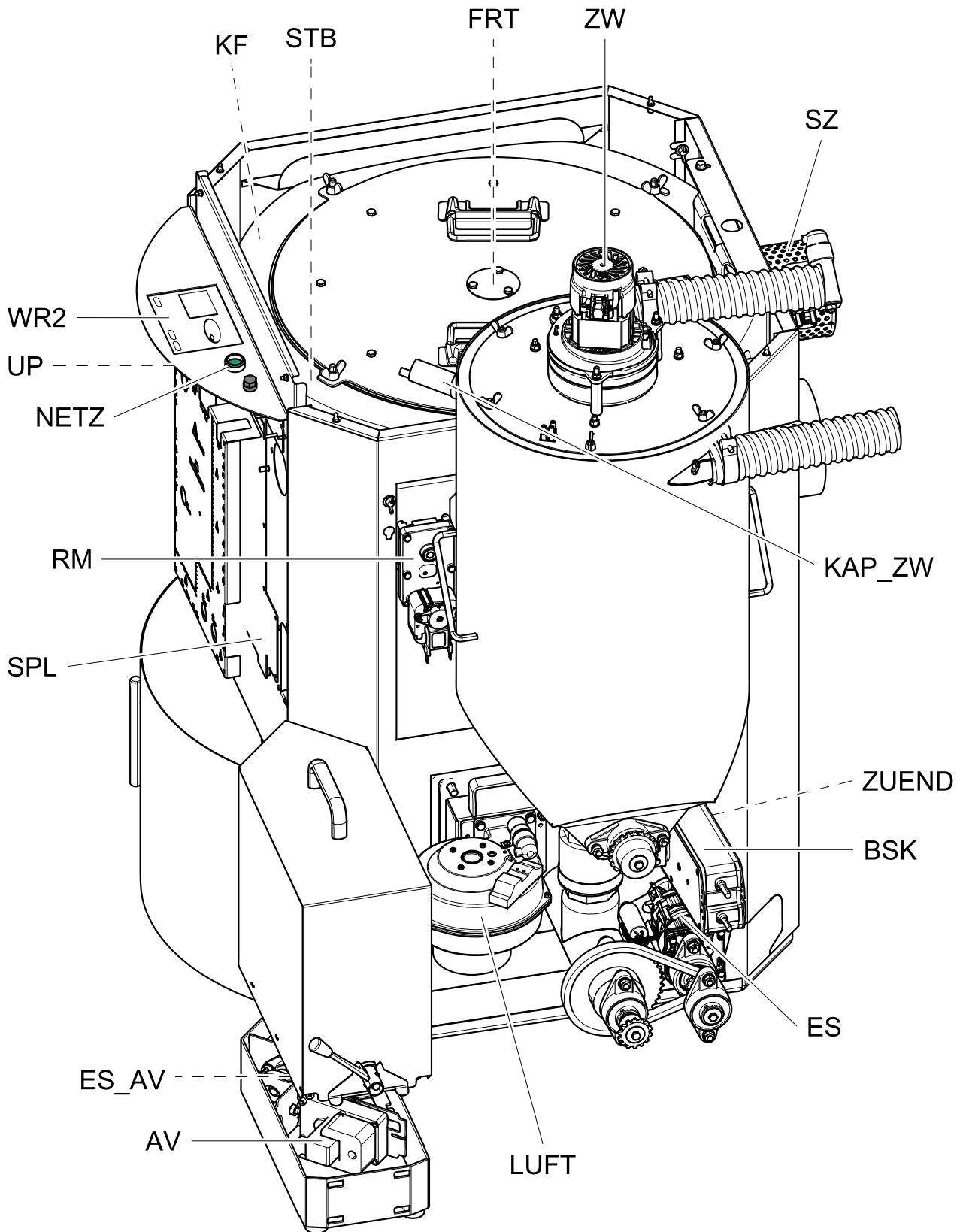


## 10.2 Plugs on the boiler controller

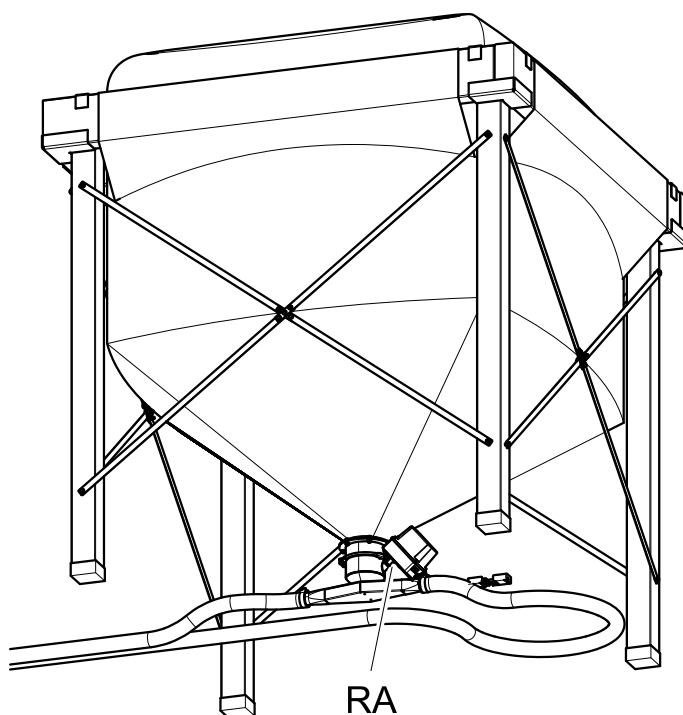
The designation of the plugs must correspond with the labeling of plug-in positions.

Designation of the plug-in position		Voltage	Name of sensors, motors and pumps
KF	8 9	24 Volt	Boiler sensor
UP	2 3 4	24 Volt	Negative draft measuring
AE2	5 6 7	24 Volt	Analog-input 2
FRT	+12 13	24 Volt	Combustion chamber sensor (optional)
RGF	+14 15	24 Volt	Flue gas sensor
BR1	7 8	24 Volt	Burner contact
AK	11 12	24 Volt	Existing boilers
ES_AV	32 33 34	24 Volt	End switch ash box
DE1	37 36 35	24 Volt	Not used
KAP_ZW	5 4 3	24 Volt	Capacitive Sensor – hopper
KAP_RA	5 4 3	24 Volt	Capacitive sensor – burner (only for auger system)
BSK	6 5 4 3 2 1	24 Volt	Fire protection – motor
ES_BSK	25 26	24 Volt	Fire protection – end switch
LUFT	11 PE N	230 Volt	Burner fan
ES	6 PE N 3 2 1	230 Volt	Burner motor
ZUEND	22 PE N	230 Volt	Ignition
MA	47 PE 48	230 Volt	Magnetic valve (only for condensing boiler)
Netz	PE N 1	230 Volt	Power supply
SPL	46 PE N	230 Volt	Vacuum suction system – relay board
RA	16 15 14 PE N	230 Volt	Fuel transport system – motor
ZW	16 15 14 PE N	230 Volt	Suction turbine
RES 1	49 PE 50	230 Volt	Motor hopper – PES 36–56 only
RES 2	53 PE 54	230 Volt	Boiler controlled pump
AV	51 PE 52	230 Volt	Motor ashbox
UW	N PE 13	230 Volt	Not used
SZ	N PE 17	230 Volt	Flue gas fan
RM	N PE 15	230 Volt	Motor boiler cleaning device
SM	20 19	dry contact	Fault signal relay (max. 5 A)
SI2	60 61	230 Volt	Not used
TUEB	13 14	230 Volt	Not used
STB	19 PE 17	230 Volt	Safety temperature sensor
NOT	43 41	230 Volt	Emergency stop heating, USA: Low water cut off
WR1	4 PE N	230 Volt	Power supply external heating controller
WR2	B A GND 24 V	24 Volt	Operating display
WR3	GND 24V B A	24 Volt	Pelletronic heating controller
EWB	A B GND	24 Volt	Not used

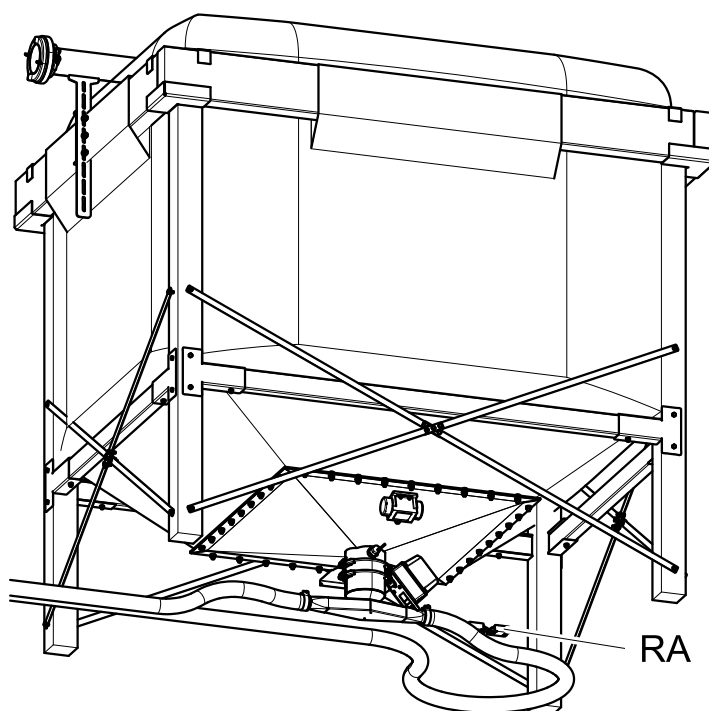
### 10.2.1 Illustration of sensors, motors and pumps



1



2



## Note

RA – Fuel transport system – is connected differently according to the storage system.

1	Textile tank – RA has to be connected to the suction switch.
2	Textile tank with vibration plate

### 10.2.2 Cable routing

Reroute cables after dismantling the casing or other system components.



## DANGER

### Electric shock

Isolate the entire heating system from the power supply before starting work on the pellet boiler.

Note the following points to ensure the cables are routed securely:

Cables must not be routed:

- over moving parts,
- over hot parts,
- or over sharp edges.

Cables must be:

- routed in the cable ducts provided and
- through cable leadthroughs,
- tied together,
- and secured with cable ties at the points provided.
- Power cables must be routed in the right-hand duct and sensor cables must be routed in the left-hand duct.



## DANGER

### Electric shock

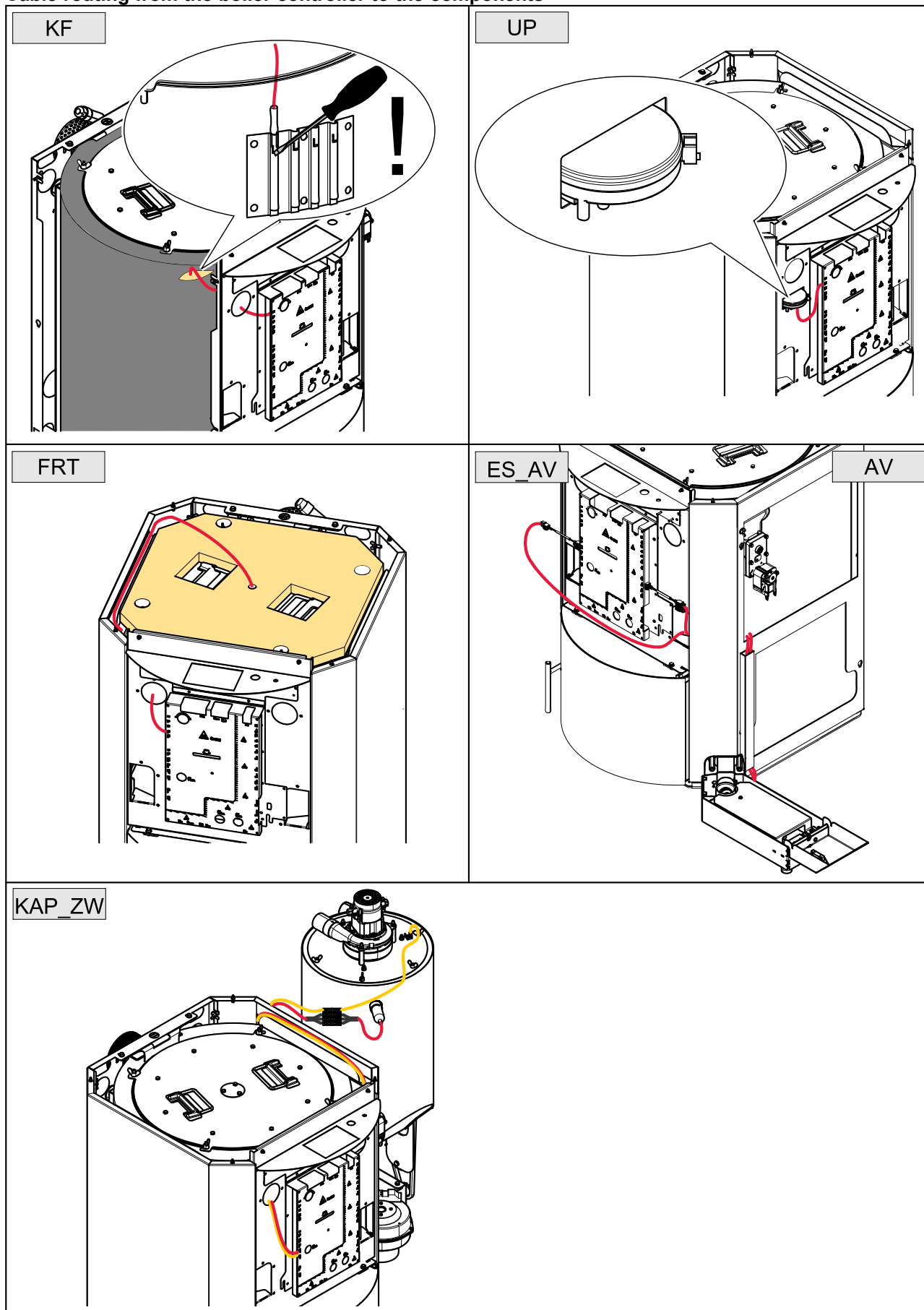
Check cables for damage.  
Replace any cables that are damaged.

## NOTICE

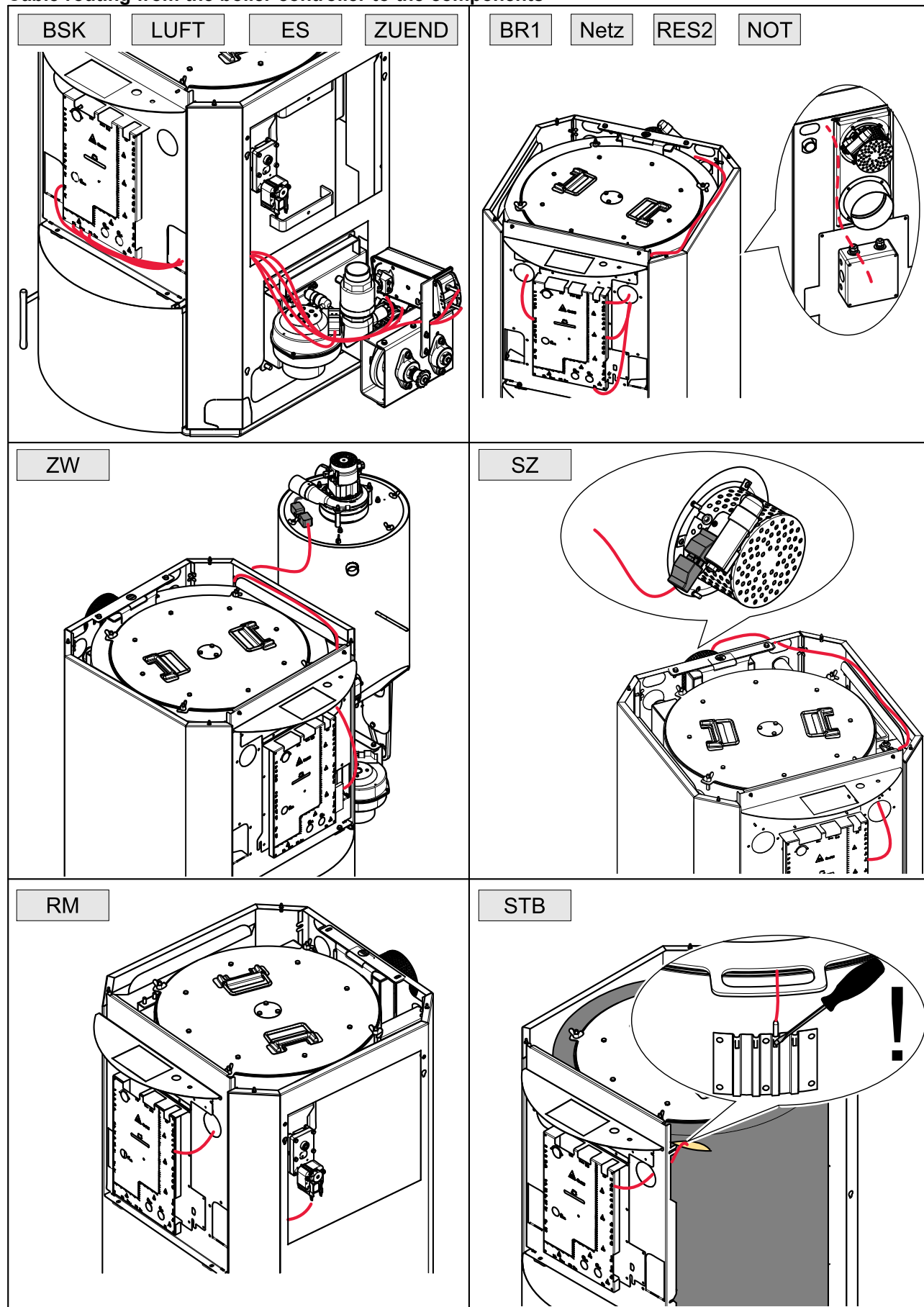
### Damage to the boiler controller

Before fitting the casing components, make sure that the cable plug connector codes match the socket codes.

## Cable routing from the boiler controller to the components



## Cable routing from the boiler controller to the components



## 10.2.3 Wiring diagrams – boiler controller

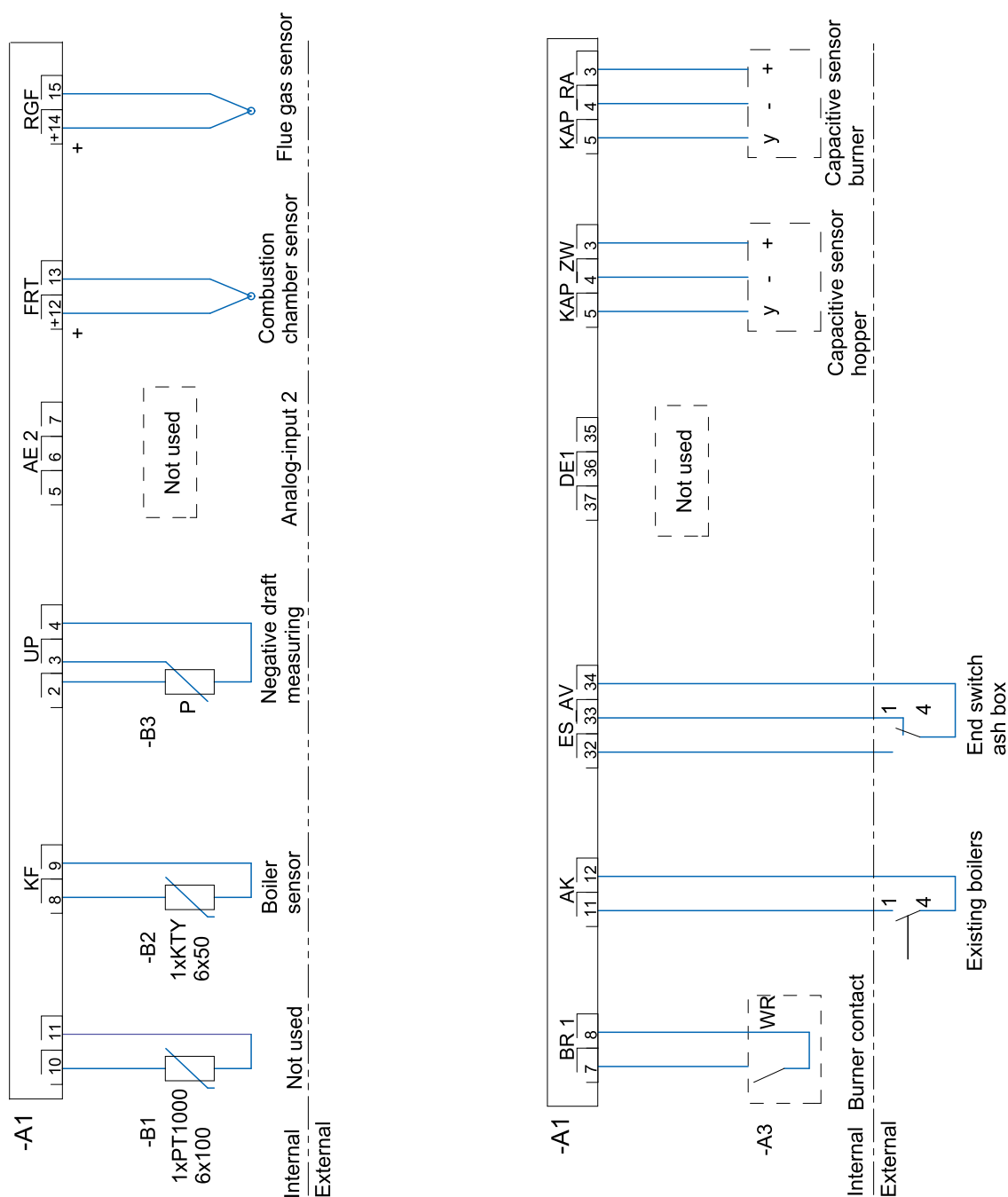
The wiring diagrams for the boiler control unit provide detailed technical information for electricians.



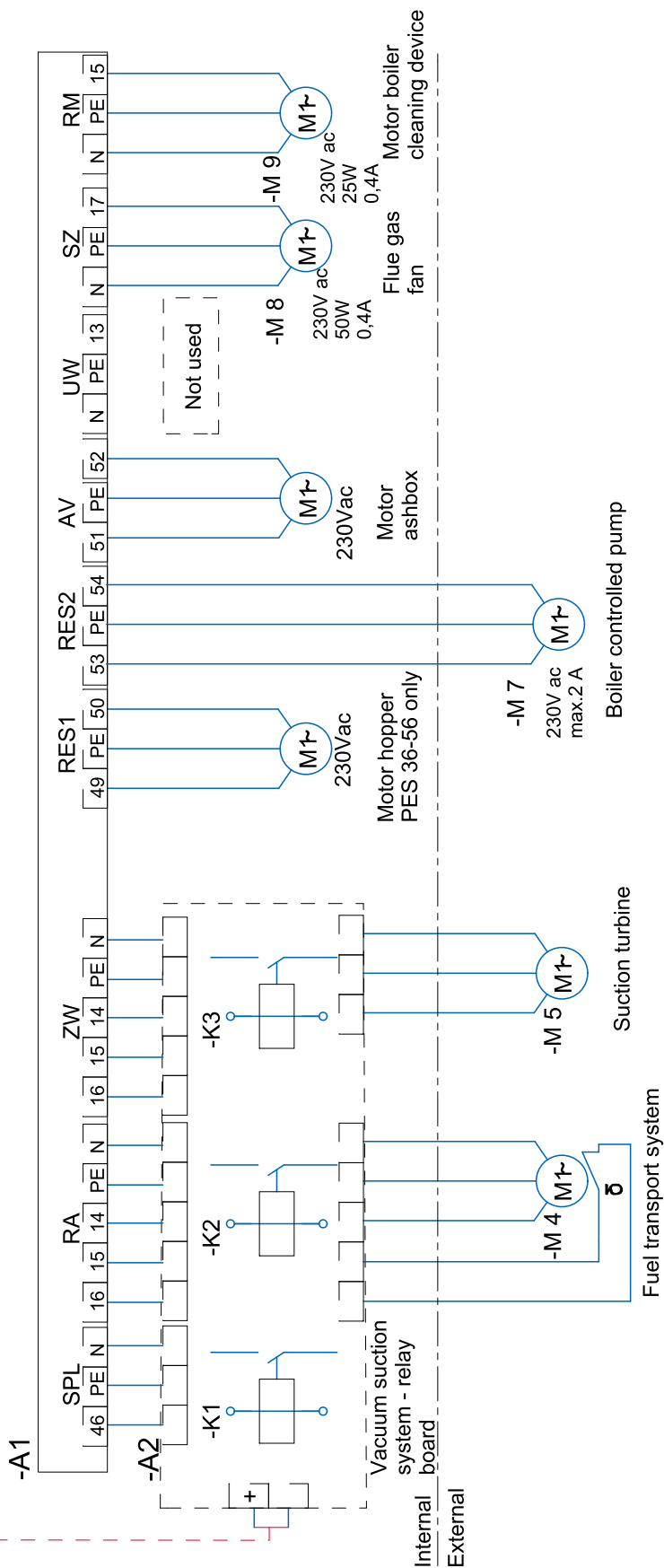
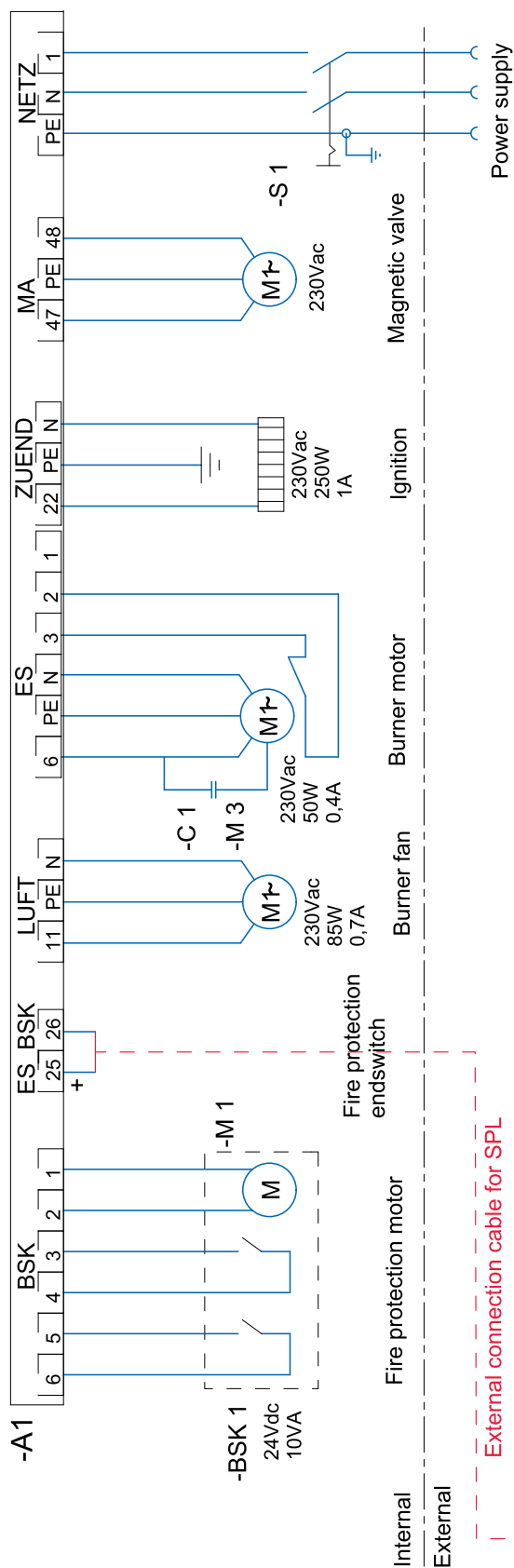
### DANGER

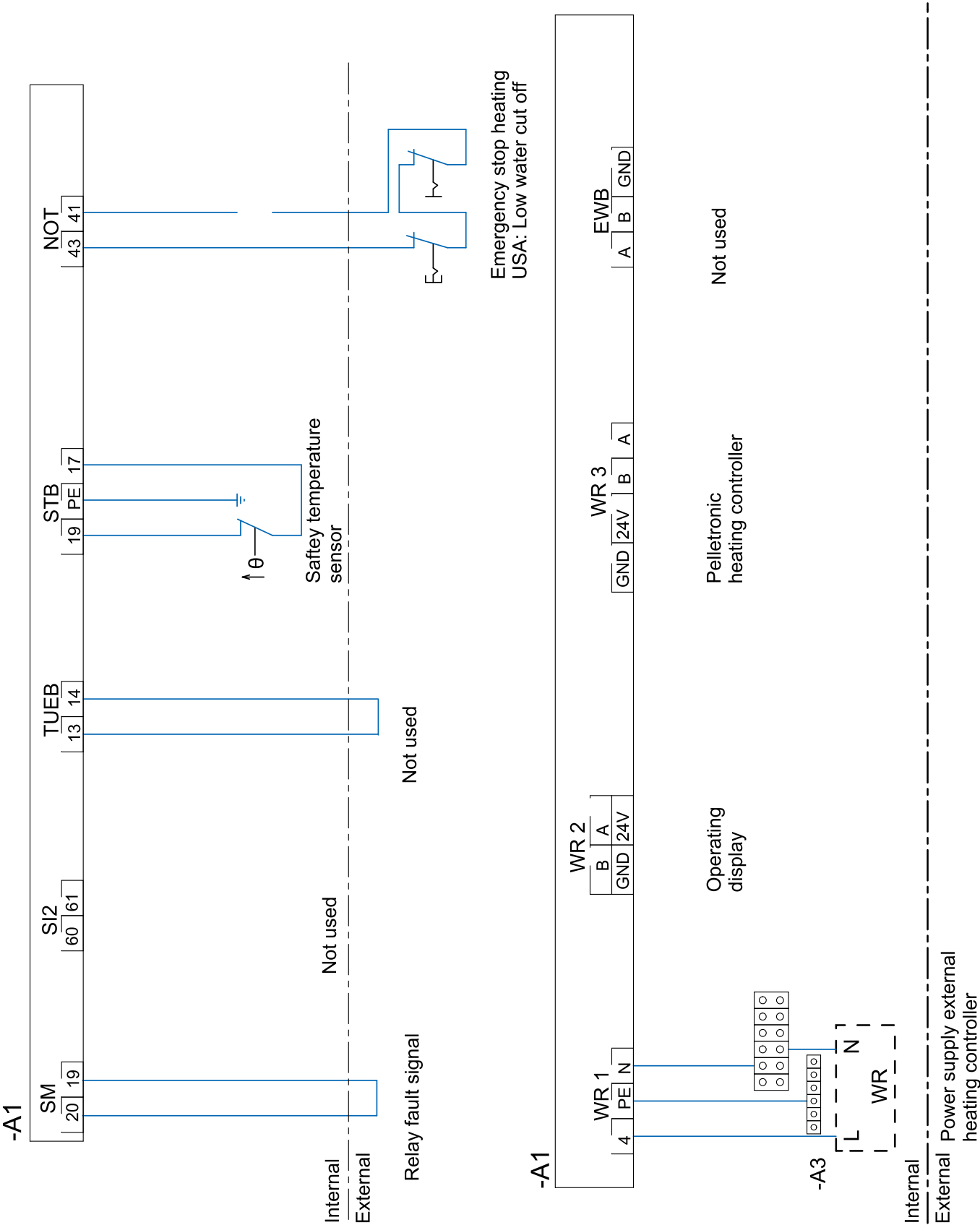
#### Electric shock

Only an authorised service technician may connect up the pellet boiler to the power supply.  
Isolate the entire heating system from the power supply before starting work on the pellet boiler.



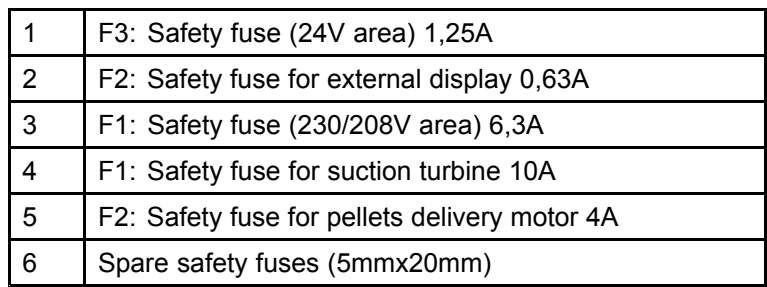






The control unit is protected against short circuits by fuses which are in the control panel (under the front boiler panel). on the boiler control unit card, behind the coloured front boiler panel are some spare fuses.

If you change microfuses, ensure correct current rating



# 11 Operating the pellet boiler

The pellet heating system is an automatic heating system. All pellet feed system and combustion system sequences are regulated automatically using an electronic boiler controller and heating controller.

## 11.1 Operating the heating system

NOTICE


**Damage caused due to incorrect operation or incorrect settings.**

Only trained operators may use the heating system. Make sure no unauthorised persons enter the central heating room. Keep children away from the central heating room and storage room.

NOTICE

**Property damage**

The allowed temperature of the boiler controller is 40 to 122°F.

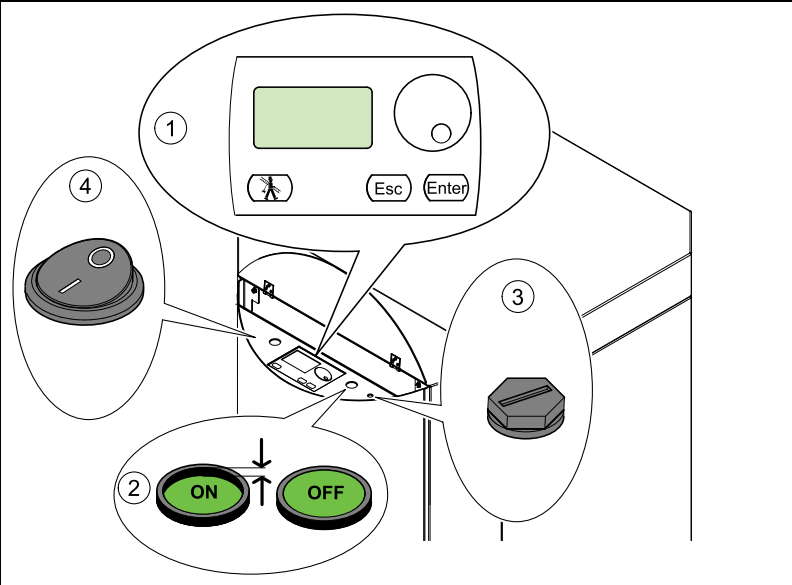
 DANGER

**Fire risk**

Keep the ash removal door closed while the boiler is in operation.

## 11.2 Description of the control panel

The control panel is located underneath the flap above the door of the boiler.



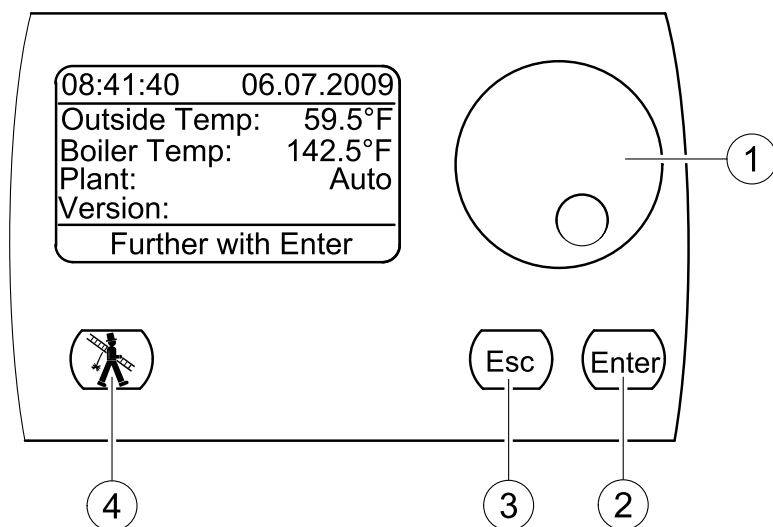
**Note**

**Summer/winter switch does not exist with an integrated Pelletronic heating controller**

1	Operating device	Operates the boiler controller and the heating controller.
2	Main switch	Switches off the heating system including the power supply to the control panel.
3	Safety temperature sensor	Switches the heating system off if the boiler temperature reaches 203°F. The heating controller remains active.
4	Summer/winter switch	<b>0 – Summer:</b> boiler operates if the connected domestic hot water thermostat is closed. <b>1 – Winter:</b> boiler operates on the adjusted boiler temperature.

## 11.3 Description operating device

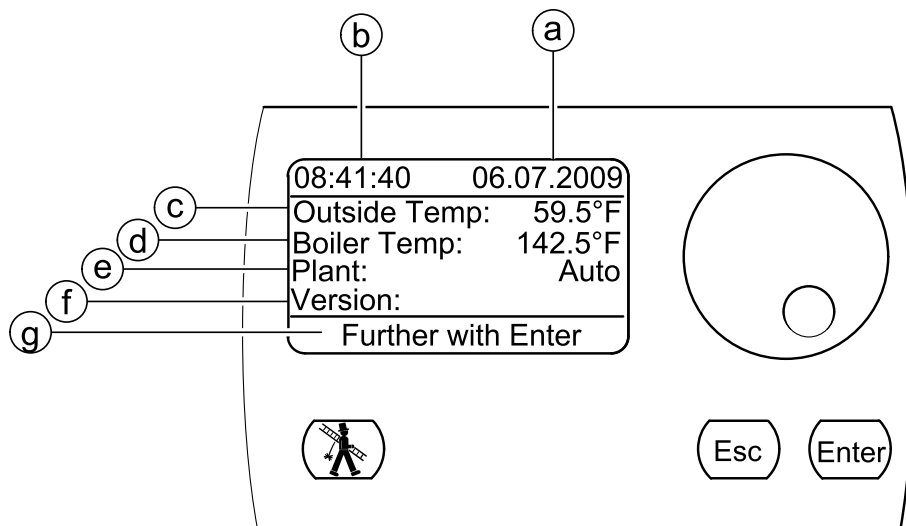
The operating device operates the heating controller and the boiler controller.



1	Thumbwheel	Select and change values
2	Enter	Confirm
3	ESC	Return
4	Chimney sweep	Used to monitor flue gas

### Start screen:

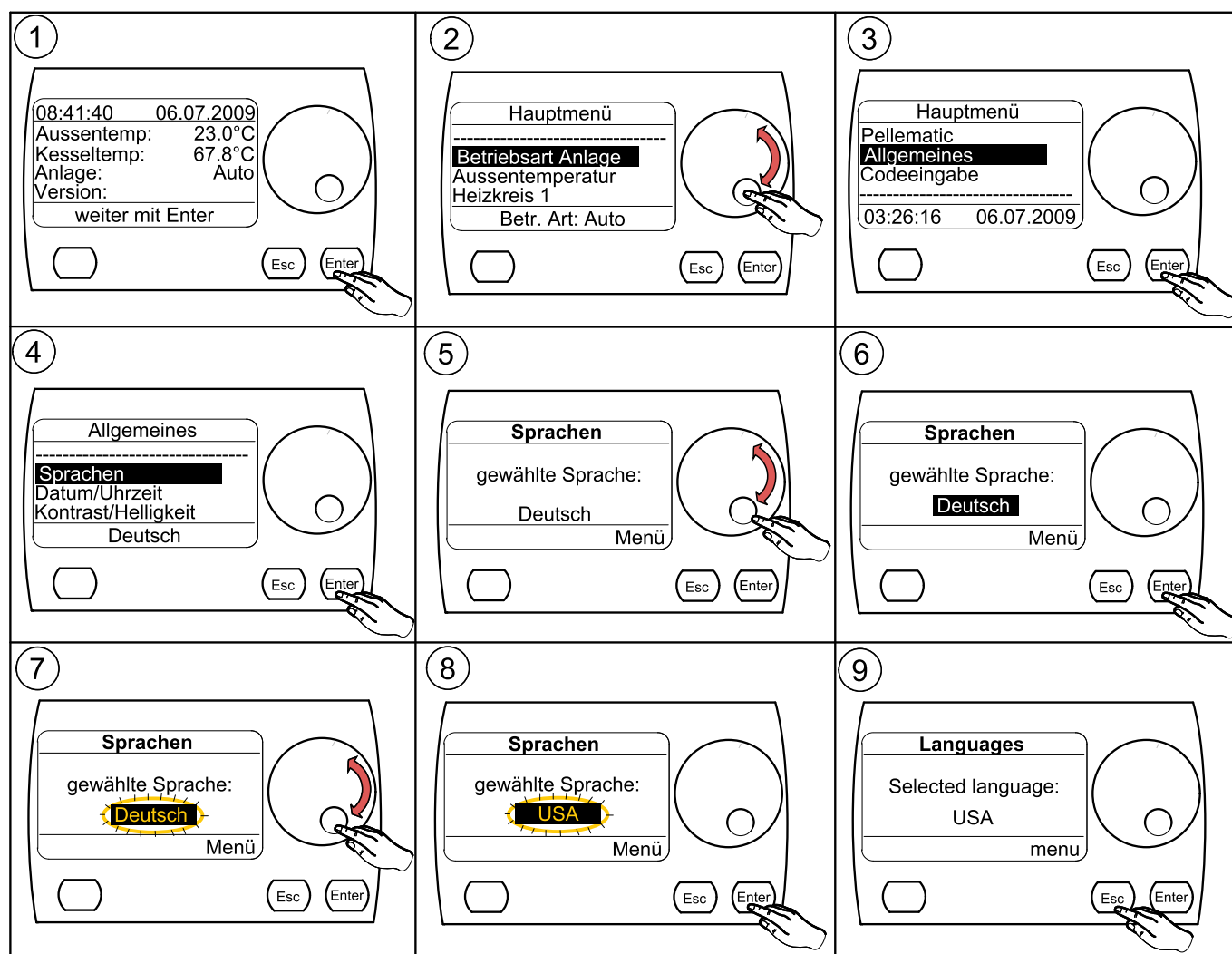
The display shows the following data during operation:



a	Date	b	Time
c	Temperature outside	d	Boiler temperature
e	Heating system mode	f	Software version
g	Command line		

## 11.4 Setting language, date and time

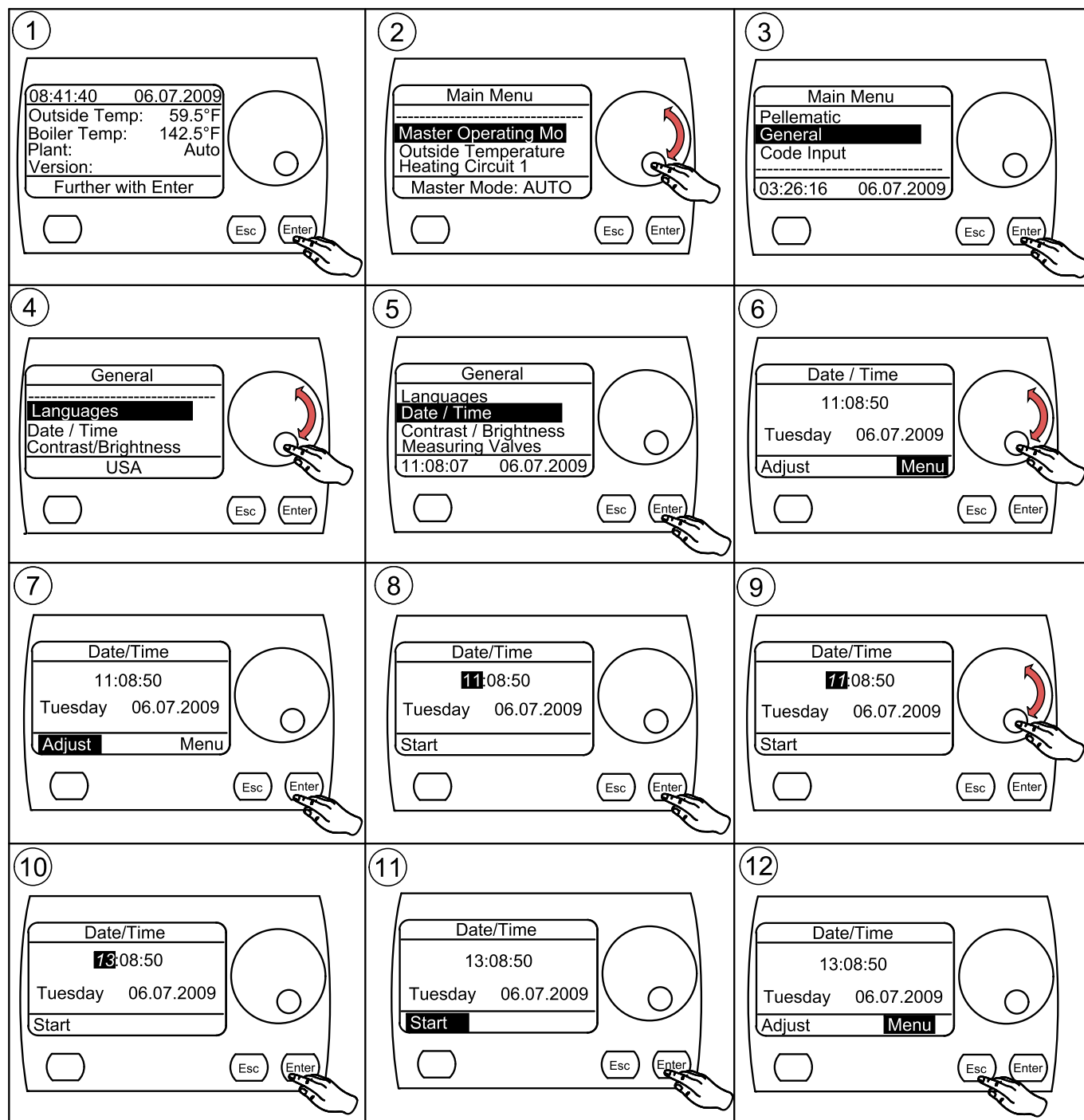
**Setting the language** (The factory setting for the language is German)



### Note

**Do not choose English – Choose USA!**

## Setting date and time

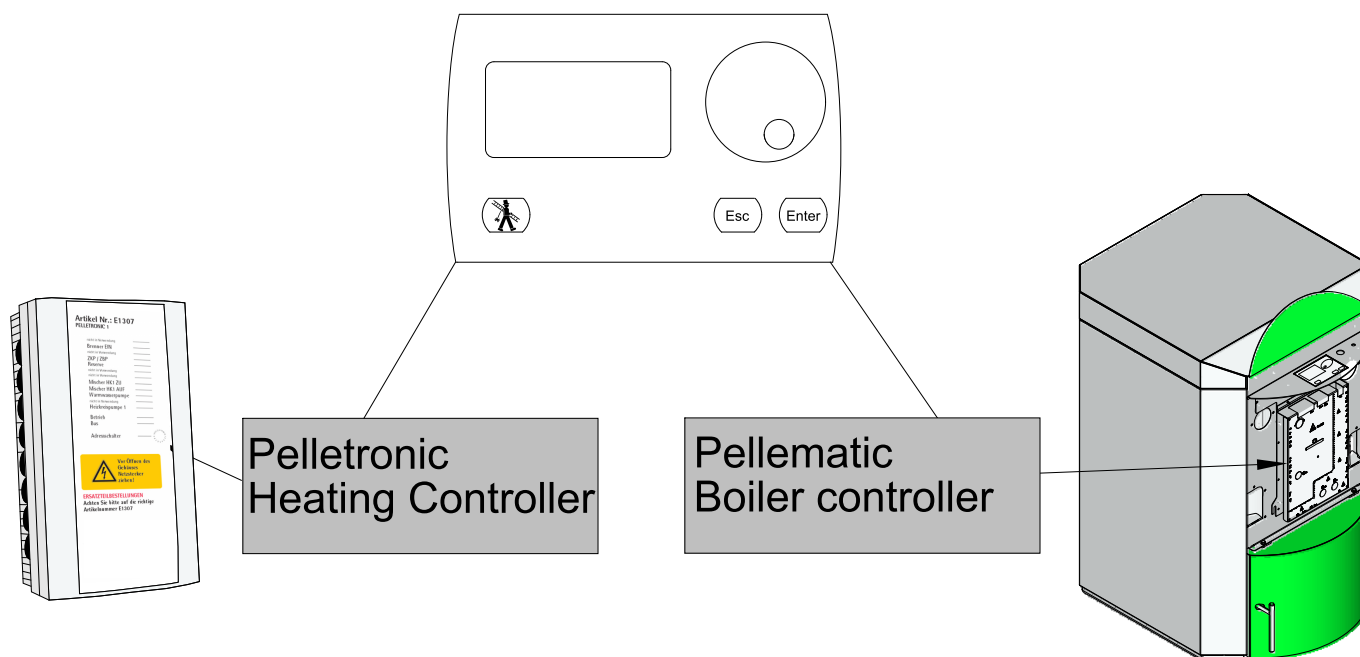


The following steps illustrate the process of setting the date and time on the pellet boiler control panel:

- Step 1:** The screen displays the current time (08:41:40) and date (06.07.2009), along with temperature and plant information. Pressing **Enter** leads to the next screen.
- Step 2:** The **Main Menu** is shown. The **Master Operating Mode** is set to **AUTO**. Pressing **Enter** leads to the next screen.
- Step 3:** The **Main Menu** is shown. The **General** option is highlighted. Pressing **Enter** leads to the next screen.
- Step 4:** The **General** menu is shown. The **Date / Time** option is highlighted. Pressing **Enter** leads to the next screen.
- Step 5:** The **General** menu is shown. The **Date / Time** option is highlighted. Pressing **Enter** leads to the next screen.
- Step 6:** The **Date / Time** menu is shown. The current time is 11:08:50 and the date is Tuesday 06.07.2009. The **Adjust** option is highlighted. Pressing **Enter** leads to the next screen.
- Step 7:** The **Date / Time** menu is shown. The current time is 11:08:50 and the date is Tuesday 06.07.2009. The **Adjust** option is highlighted. Pressing **Enter** leads to the next screen.
- Step 8:** The **Date / Time** menu is shown. The current time is 11:08:50 and the date is Tuesday 06.07.2009. The **Start** option is highlighted. Pressing **Enter** leads to the next screen.
- Step 9:** The **Date / Time** menu is shown. The current time is 11:08:50 and the date is Tuesday 06.07.2009. The **Start** option is highlighted. Pressing **Enter** leads to the next screen.
- Step 10:** The **Date / Time** menu is shown. The current time is 13:08:50 and the date is Tuesday 06.07.2009. The **Start** option is highlighted. Pressing **Enter** leads to the next screen.
- Step 11:** The **Date / Time** menu is shown. The current time is 13:08:50 and the date is Tuesday 06.07.2009. The **Start** option is highlighted. Pressing **Enter** leads to the next screen.
- Step 12:** The **Date / Time** menu is shown. The current time is 13:08:50 and the date is Tuesday 06.07.2009. The **Adjust** option is highlighted. Pressing **Enter** leads to the next screen.

## 11.5 Menu configuration

The operating device is used to operate the boiler controller **and** the heating controller



### Note

The heating controller menu levels are only enabled if a Pelletronic heating controller is installed.

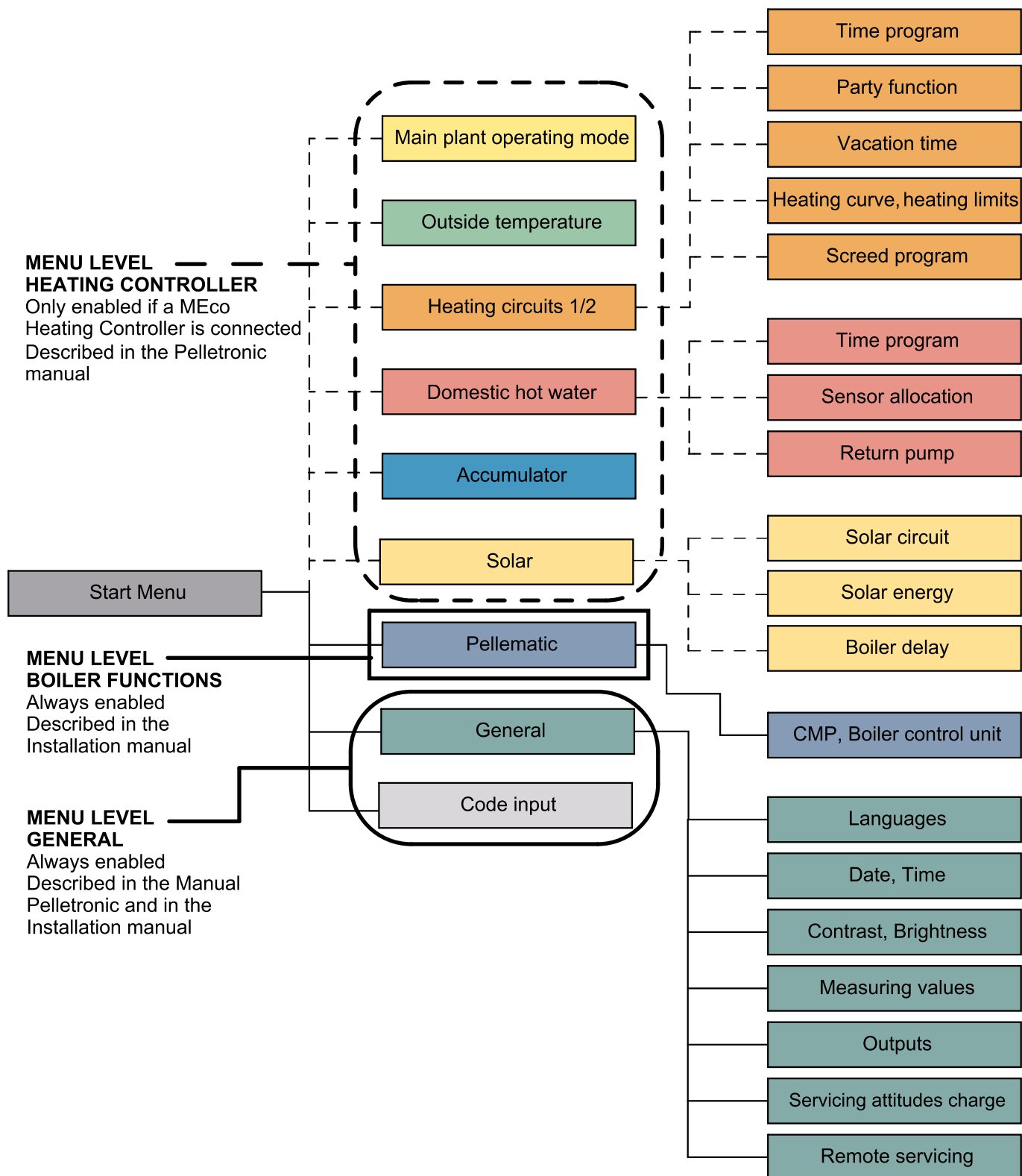
## NOTICE

### Damage to property and loss of warranty

Do not change any of the factory settings or settings in the protected parameter level



## Menu configuration



### Note

The heating controller functions are described in the **Pelletronic Plus** instruction manual.

## 12 Starting up for the first time

After bringing in the boiler, connecting up the hydraulics and power supply, the unit can be started up for the first time.

### Note

The unit must be started up for the first time by an authorised MEco service technician.

Before starting up the pellet boiler, the following settings must be made in the sequence specified below:

1. Adjust power rating
2. Settings in the boiler control unit
3. Output test - test all motors
4. Settings in heating controller (if installed)
5. Start the pellet boiler

Use the checklist enclosed to document the start-up procedure.

## NOTICE

### Property damage

The allowed temperature of the boiler controller is 40 to 122°F.

### 12.1 Adjusting power rating

On MEco pellet boilers the effective heat exchanger area can be changed within a unit range. This involves opening or closing the heat exchanger tubes. The power rating of the pellet boiler is adjusted as a result. MEco supplies the pellet boilers in one type group with the power rating shown below. If the condition as shipped is different from the power rating on the data plate supplied, then the service technician must adjust the power rating before starting up for the first time.

#### 12.1.1 Installing the turbulators and closure plugs

The heat exchanger in the pellet boiler has between 12 and 36 heat exchanger tubes, depending on the size of the boiler. Springs are installed inside the heat exchanger tubes to clean the tubes as well as act as turbulators.

#### Increasing the boiler power rating

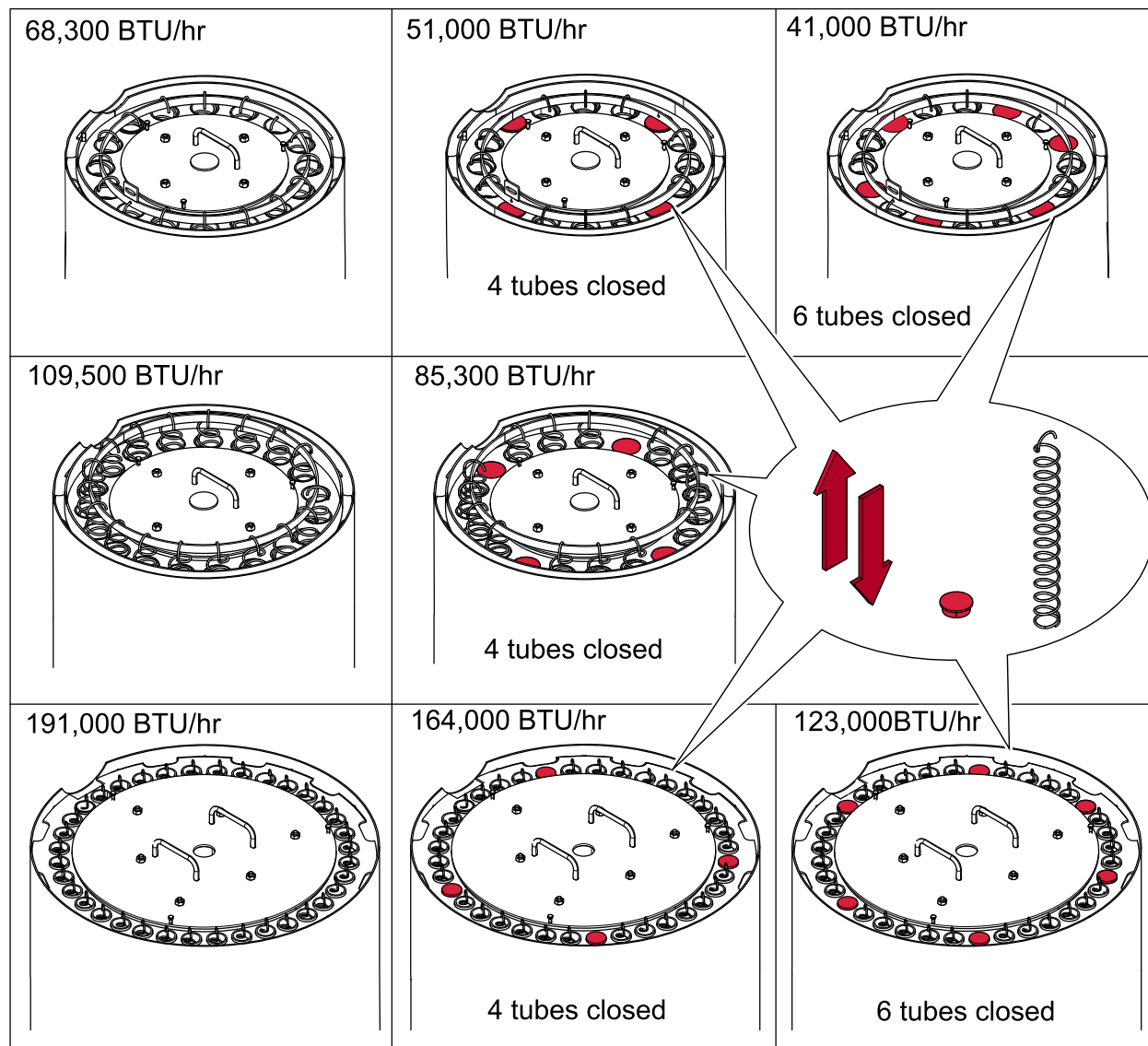
1. Remove the closure plugs from the ends of the heat exchanger tubes.
2. Insert the turbulators supplied into the heat exchanger tubes.
3. Hook the turbulators onto the ring of the cleaning system.

#### Reducing the boiler power rating

1. Unhook the turbulators from the ring of the cleaning system.
2. Remove the cleaning springs/turbulators from the heat exchanger tubes.
3. Close off the heat exchanger tubes using the closure plugs supplied.

**Number of cleaning springs (tubulators) to be removed/installed:**

Boiler power ratings as per data plate	No. of springs	Delivery status power rating	No. of springs	
41,000 BTU/h	10	68,300 BTU/h	16	Remove 6 turbulators
51,000 BTU/h	12	68,300 BTU/h	16	Remove 4 turbulators
68,300 BTU/h	16	68,300 BTU/h	16	No adjustment required
85,300 BTU/h	16	109,500 BTU/h	20	Remove 4 turbulators
109,500 BTU/h	20	109,500 BTU/h	20	No adjustment required
123,000 BTU/h	30	191,000 BTU/h	36	Remove 6 turbulators
164,000 BTU/h	32	191,000 BTU/h	36	Remove 4 turbulators
191,000 BTU/h	36	191,000 BTU/h	36	No adjustment required



### 12.1.2 Adjusting the boiler controller

The boiler controller must be adjusted to match the changed boiler power rating.

#### Parameter level 200

Open the menu **Pellematic** at the operating device. Parameter level 200 is exclusively for customer service technicians and MEco employees. You access parameter level 200 by entering the code in parameter P199. The code for parameter level 200 is the sum of day plus hour, e.g. : Day: **26**/ 08/ 2009 and hour: **14**:30:47; (26 + 14 = 40) results in the code: 26 + 14 = 40.

Then go to parameter 265 and adjust the boiler power rating

Para- meter	Display on screen	Description	Adju- stable	Factory setting
P265	Power level P265: level 15	Adjusting the boiler power rating	yes	15/25/36

#### Note

The setting for parameter 265 is the factory setting for the boiler power rating

## 12.2 Settings in the boiler controller

Parameters that you must adjust to the relevant boiler type.

P265	Adjusting the boiler power rating
P263	Setting the boiler setpoint temperature, default 175°F
P202	Setting the switch-off temperature, default 185°F
P212	Activating the de-ashing system, if installed
P270	Activating the flame sensor, if installed (optional)
P213	Activating the level detection system, if weighting cells are installed (optional)

## 12.3 Output test

The output test is designed to test all outputs connected to the system (e.g. all motors, the alarm signal relay, the solenoid valve and the recirculation pump).

### Parameter level 200

Open the menu **Pellematic** at the operating device. Parameter level 200 is exclusively for customer service technicians and MEco employees. You access parameter level 200 by entering the code in parameter P199. The code for parameter level 200 is the sum of day plus hour, e.g. : Day: **26**/ 08/ 2009 and hour: **14**:30:47; (26 + 14 = 40) results in the code: 26 + 14 = 40

Then go to parameter 203 to test all outputs.

Parameter	Display on screen	Description	Adjustable	Factory setting
P203	Output test P203: Enter	Output test - using the thumbwheel you can select each individual output. Press Enter to switch the output on. The current power draw is shown for motors. Press Enter again to switch the output off. The outputs for the suction fan and the air blower can be increased by 20% each time the button is pressed. Once you have reached 100%, the next press of the button returns the setting to 0%. Exit the output test menu at the bottom of the list.	yes	

### Outputs/motors

Designation	Check if	If not, then check if
Burner motor ES	the motor that feeds pellets to the burner is running	<ul style="list-style-type: none"> <li>the burner motor is connected</li> <li>the burner motor rotates easily</li> <li>the motor is defective</li> </ul>
Suction turb ZW	the suction turbine at the hopper is running	<ul style="list-style-type: none"> <li>the suction turbine is connected</li> <li>the fuse is defective</li> <li>the motor is defective</li> </ul>
Fuel tr sys M RA	the fuel transport system – motor is running	<ul style="list-style-type: none"> <li>the fuel transport system motor is connected</li> <li>the fuel transport system motor rotates easily</li> <li>the fuel transport system motor is defective</li> </ul>
De-ashing motor AV (optional for PE 12–32)	the motor de-ashing system is running	<ul style="list-style-type: none"> <li>the de-ashing system is switched on (P212)</li> <li>the de-ashing system is properly located and locked in position</li> <li>the de-ashing system is correctly wired up</li> </ul>
Burner plate de-ashing motor AV (optional for PE 12–32)	the burner plate de-ashing motor is running	<ul style="list-style-type: none"> <li>the burner plate de-ashing system is switched on (P212)</li> <li>the burner plate de-ashing system is properly located and locked in position</li> <li>the burner plate de-ashing system is correctly wired up</li> </ul>
Burner fan LUFT	the burner fan is running  <b>Note</b> You can set 5 power levels: 20/40/60/80/100)	<ul style="list-style-type: none"> <li>the wiring is correct</li> <li>the motor is defective</li> </ul>

Magnet valve MA	the magnetic valve switches over and you can hear it click <b>Note</b> <b>Condensing boiler only</b>	<ul style="list-style-type: none"> <li>the scrubber is connected</li> <li>the scrubber is defective</li> </ul>
Flue gas fan SZ	the flue gas fan is running <b>Note</b> You can set 5 power levels: 20/40/60/80/100	<ul style="list-style-type: none"> <li>the wiring is correct</li> <li>the motor is defective</li> </ul>
Boil clean M RM	the cleaning motor raises and releases the cleaning springs	<ul style="list-style-type: none"> <li>the terminal bolts on the shaft are tight</li> <li>the motor is defective</li> </ul>
Malfunc relay SM	the malfunction relay switches on and off: you can hear it clicking on and off	<ul style="list-style-type: none"> <li>the wiring is correct</li> <li>the malfunction relay is defective</li> </ul>
Ignition ZUEND	the electrode is working: you can view the current draw at the control unit after it has been switched on.	<ul style="list-style-type: none"> <li>the wiring is correct</li> <li>Check the ignition electrode</li> </ul>
Fire pro sys BSK	the fire protection ball valve(orange motor on burner) opens	<ul style="list-style-type: none"> <li>the wiring is correct</li> <li>the ball valve moves easily</li> <li>the motor is defective</li> </ul>
Boiler cont P RES2	the boiler controlled pump is running <b>Note</b> only possible if the boiler controlled pump is connected	<ul style="list-style-type: none"> <li>the wiring is correct</li> <li>the boiler controlled pump is defective</li> </ul>
Hopper M RES1	the hopper motor that feeds pellets from the hopper to the burner auger is running <b>-only on PES 36 – 56</b>	<ul style="list-style-type: none"> <li>the burner motor is connected</li> <li>the burner motor rotates easily</li> <li>the motor is defective</li> </ul>

The system is ready for operation after all outputs/motors have been thoroughly tested

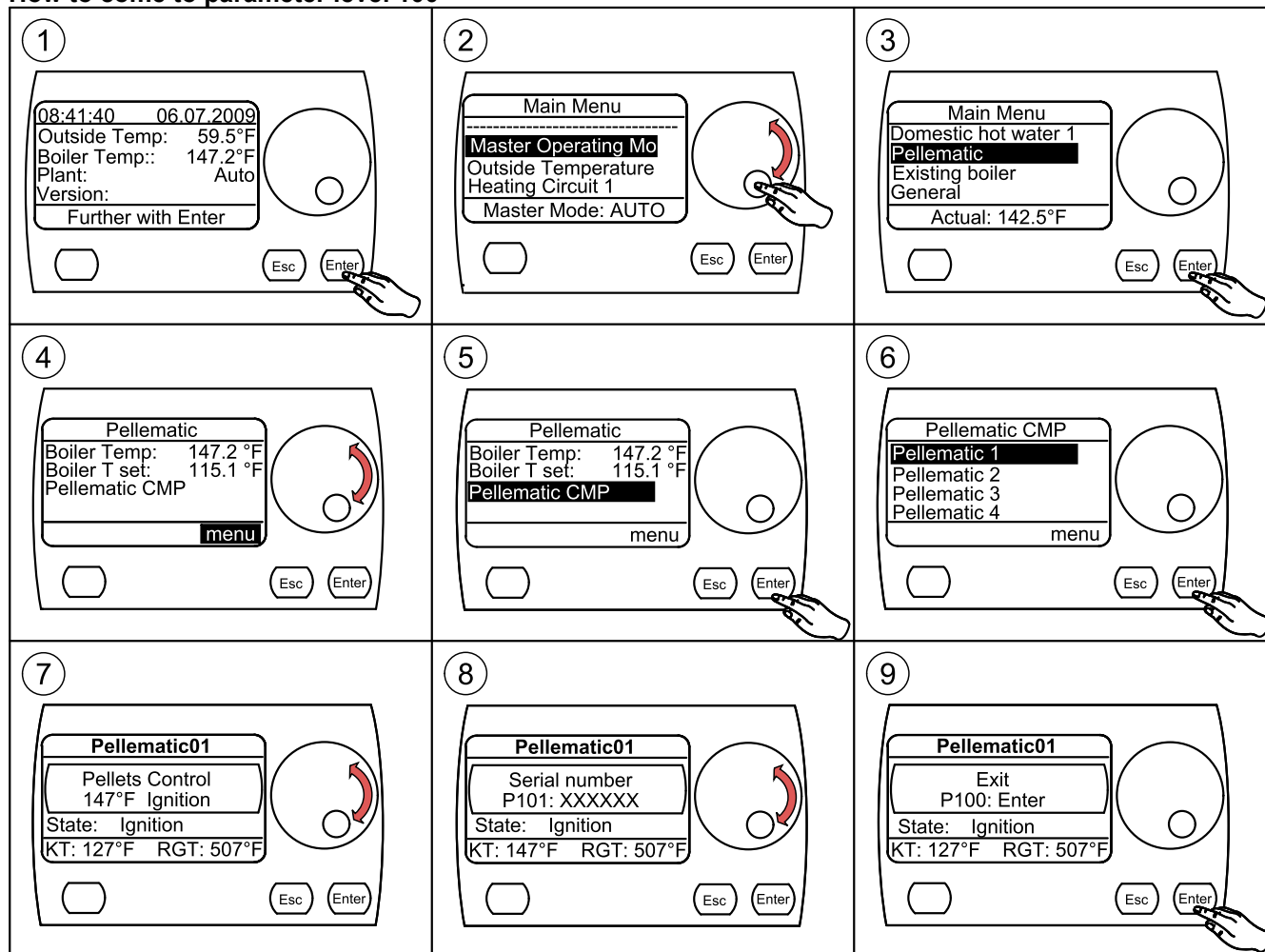
## **Note**

In order to find the sensors, motors or pumps on the boiler look 10.2 **Plugs on the boiler controller**

## 12.4 Parameter level 100

You can use this parameter to adjust the function of the pellet heating system. Parameter level 100 has 99 values, from 100 – 199. Not all parameters are implemented. Parameters that are not used are also not displayed on the operating device.

### How to come to parameter level 100



### Note

There are adjustable parameters and non-adjustable parameters. To change adjustable parameters, press Enter to go into edit mode. Pressing Enter has no effect on non-adjustable parameters.

The control unit automatically returns to the start screen if you have not made any entries for the last 10 minutes.

### Changing a parameter

1. Select a parameter using the thumbwheel.
2. Press Enter
3. ►Parameter appears in brackets◀
4. Change the value of the parameter using the thumb wheel
5. Confirm by pressing Enter

## Description of parameter

Parameter	Display on screen	Description	Adjustable	Factory setting
P100	Exit P100: Enter	Standard display: <ul style="list-style-type: none"> <li>Press ENTER once — displays boiler temperature</li> <li>Press ENTER again — displays day, date, time, version of PLC program and power rating setting.</li> </ul>	yes	
P101	Serial number P101: 00081	Serial number of CMP controller.	no	
P104	Continuous mode P104: Enter	Pressing ENTER activates the continuous operation function. First of all the fire protection system on the burner opens the fire protection flap (BSK) – this process takes approx. 2 min. The burner motor then runs continuously, transporting pellets to the burner plate. The pellet auger also runs continuously on heating systems fitted with an auger fuel transport system.		
P105	Boiler temp. P105: 145°F	Current boiler temperature	no	
P106	Flue gas temp. P106: 242°F	Current flue gas temperature	no	
P107	AGT/FRT temp. P107: 1009°F	Combustion chamber temperature (displayed only if NiCrNi flame sensor is connected)	no	
P109	Controller temp. P109: 73°F	Current temperature of boiler controller circuit board	no	
P110	Cap. hopper P110: 0	Capacitive sensor on hopper: 0 = material available 1 = no material available  <b>Note</b> Displayed on vacuum-type conveyor systems Optional on auger-type systems	no	
P111	Cap. burner P111: 2	Capacitive sensor on burner: 2 = material available 0 = no material available	no	
P112	Burner starts P112: 345x	Number of system burner starts	no	
P113	Burner run time P113: 3562h	Burner run time in hours	no	
P114	Average run time P114: 127m	Average run time per burner start	no	
P115	Downtime P115: 3267m	Time expired since last burner stop. This value also applies to the boiler being switched off intermittently. The maximum value is 65000 min	no	
P116	Run time P116: 96zs	Run time of burner auger in tenths of a second.	no	
P117	Rest time P117: 80zs	Rest time of burner auger in tenths of a second.	no	
P118	Current air flow rate P118: 39%	Burner fan power in percent.	no	



P119	Current flue gas P119: 30%	Flue gas fan power in percent.	no	
P120	Current ignition P120: 128s	Current ignition time This is 0 if the ignition is not active.	no	
P124	Comb ch setpoint P124: 1472°F	Combustion chamber setpoint Displayed on while combustion chamber temperature control is active and the combustion chamber sensor is connected.	no	
P125	Negative draft P125: 60EH	Displays negative draft in the combustion chamber.	no	
P126	Analog input 2 P126: 45%	not implemented	no	
P130	AGT ign/comb. P130: 212°F	Minimum flue gas temperature as condition for ignition and combustion chamber control. Displayed only with flue gas sensor connected.	no	
P131	Flue gas min. P131: 212°F	The minimum flue gas temperature for the boiler controller. If the temperature falls below the minimum flue gas temperature, the boiler increases the power independently of the boiler temperature. Displayed only with flue gas sensor connected	yes	100
P132	Current weight P132: 74kg	Displayed only, if P233 is 1. Display of the current weight in the FlexILO textile tank.		
P133	Current weight P133: 74kg	Displayed only, if P233 is 2. Display of the current weight in the storage room.		
P134	Low weight lim P134: 0kg	Displayed only, if P233 is 1 or 2. The threshold value, the minimum weight for a warning message, can be varied. The warning message appears on the operating device and disappears when the filling weight is above the set minimum weight.		
P135	Weight hopper P135: 0kg	Displayed only, if P233 is 2. Display of the current weight in the hopper.		
P136	Pellet level P136: 0	Displayed only, if P233 is 3. Display of the pellet level 1 = full 0 = empty – warning message displayed on the operating device.		
P137	Refill capacity P137: 0kg	Displayed only, if P233 is 3.  Set the filling capacity after refilling the storage		
P138	Save capacity P138: 0	Displayed only, if P233 is 3. Save the set filling capacity. By turning to 1 the filling capacity is added to the actual weight and P137 is reset to 0		
P152	Motors P152: Enter	Pressing ENTER takes you to the motors sub-menu. Select a motor using the thumbwheel. The following data are displayed for each motor connected: mA-actual, Volt-actual, mA-minimum-setpoint, mA-maximum-setpoint, operating hours, time duration that the motor may operate outside the Min-Max values before an alarm is triggered. The Min-Max values and time duration are adjustable.	ja	

P160	Fuel Corr. P160: Step:00	The burner auger running duration is calculated automatically by the PLC depending on the rated power and the boiler setpoint temperature. The burner motor is controlled accordingly. You can reduce or increase the value calculated by the PLC 10 steps up or down.	yes	0
P161	Ext Auger delay P161: 0	Delay of the extraction auger in compare to the burner auger – only for Auger delivery systems.		
P162	Modulation level P162: 17	Current modulation level of boiler. You can set the modulation level to measure the flue gas if P 163 flue gas measurement is active.	yes	17
P163	Flue gas measure P163: 0	If flue gas measurement is active, the modulation level of the boiler is switched off. This can be set in P162. This remains fixed for the duration of the activation. 0 = inactive 1 = active – minimum power 17= maximum power.  <b>Note</b> After 20 minutes has expired, (P164) the flue gas measurement finishes automatically.	yes	0
P164	Flue gas meas ti P164: 20m	Max. duration of flue gas measurement Displayed only if P163=1	yes	20
P170	Burner start P170: 0	Select between 2 types of burner control:  0: Pellet boiler runs inline with the burner demand signals from the heating controller  1: Pellet boiler starts, if it receives a single pulse from the heating controller and switches off when the switch-off temperature is reached.	yes	0
P171	Malfunction output P171: 0	When a malfunction occurs the boiler controller triggers the malfunction relay. The potential-free contact (output SM 20 19) enables the alarms to be displayed using an external malfunction system (230V). You can select the following functions: <b>0:</b> The contact closes when a malfunction occurs – normally open <b>1:</b> When a malfunction occurs the contact opens and closes in flashing pulses. 1 pulse = all other malfunction 2 pulses = one of the sensors is defective 3 pulses = one of the motors is defective 4 impulses = safety temperature sensor Emergency OFF <b>2:</b> If a malfunction occurs the contact opens – normally closed <b>3:</b> When malfunction "Ash box full" occurs a flashing pulse is signalled and all malfunction contacts closes  <b>Note</b> If a remote maintenance system is implemented then an SMS text is transmitted for each flashing contact.	yes	0
P172	Flashing time P172: 20s	Flashing time for warning "Ash!", parameter 171 must be set to 3.	yes	20
P173	Flashing pulse P173: 1	Flashing pulse for warning "Ash!", screen must indicate 3 for the fault display.	yes	1

P180	Function RES2 P180: 2	Output boiler controlled pump RES2 (230V): is used to control a accumulator pump, etc. 1 = release the output when minimum boiler temperature is exceeded (P281) 2 = release the output when minimum boiler temperature is exceeded (P281) and burner is requested (burner runout time approx. 30 minutes, P280, value adjustable	yes	2
P181	Power RES2 P181: 100%	Display power draw of boiler controlled pump during pulse mode	no	
P183	Runout time P183: 6h	Remaining burner runout time(hours) after malfunction text "ash box full" until total switch-off.	yes	6
P184	Ash auger speed P184: 0 rpm	Displays speed of de-ashing auger	no	
P185	Run time suction P185: 80m	Run time (minuts) of burner auger until next suction interval	no	
P186	Suction time total P186: 68h	Operating hours of suction turbine, only on vacuum systems.	no	
P187	Frequ RA vacuum P187: 60s	Frequency for storage room suction systems in pulse mode, only for vacuum systems - only if parameter 188 < 0	yes	60
P188	Pause RA vacuum P188: 0s	Pause time for storage room extractor motor - suction system in pulse mode. If pause time = 0 then no pulse mode.	yes	0
P189	Cleaning hour 1 P189: -1h	In parameter 190 you can set an additional boiler cleaning time. The value to be set is the time (full hour) at which the boiler cleaning sequence is to be performed. Example: 10h = additional boiler cleaning at 10:00. -1h = no additional cleaning sequence will be performed.	yes	-1
P190	Cleaning hours 2 P190: 20h	The value to be set is the time (full hour) at which the boiler cleaning sequence is to be performed. Example: 20h = additional boiler cleaning sequence to be performed at 20:00.  <b>Note</b> On vacuum systems the hopper is also filled at the same time, regardless of whether it is empty or not.	yes	20
P191	Min run time RM P191: 12h	Minimum running time (hours) of boiler until next cleaning sequence.	yes	12
P192	Cleaning duration P192: 120s	Duration of the boiler cleaning sequence in seconds.	yes	120
P193	Min run time scrubbing P193: 6h	Minimum running time (hours) of boiler until next cleaning of heat exchanger - <b>only on condensing boilers</b> .		6
P194	Scrubbing duration P194: 45s	Duration of scrubbing low temperature heat exchanger - <b>only on condensing boilers</b> .		45
P195	Min run time ash P195: 120min	Minimum running time of boiler until next de-ashing procedure, value adjustable - parameter available only when external de-ashing system is connected.	yes	120/80/45
P196	Ash duration P196: 3min	Duration of running time (minuts) of ash auger, value adjustable, parameter for external de-ashing system only.	yes	3/3/5

P197	see below	Status display of INPUTS*	yes	
P198	see below	Status display of OUTPUTS*	yes	
P199	Level 2 Code P199: 0	Level 2 - Customer service level MEco, input code	no	

## P 197 — Status display of inputs

	A	B	C	D	E	F	G	H
" INP:	0	1	0	0	0	1	0	0
" P197:	0	0	0	1	0	0	1	0
	I	J	K	L	M	N	O	P

Indication: 0 = OFF  
 Indication: 1 = ON

A	Capacitive sensor hopper	I	Limit switch external ash box
B	Capacitive sensor RA	J	Suction circuit board safety relay
C	Fire protection system open	K	Safety temperature system
D	Fire protection system closed	L	Low H2O
E	Burner motor	M	not implemented
F	Fuel transport system motor	N	not implemented
G	Burner request	O	Suction turbine
H	Input existing boiler	P	not implemented

## P 198 — Status display of outputs

	A	B	C	D	E	F	G	H
" OUT:	0	1	0	0	0	1	0	0
" P198:	0	0	0	1	0	0	1	0
	I	J	K	L	M	N	O	P

Indication: 0 = OFF  
 Indication: 1 = ON

A	Burner fan	I	Magnetic valve
B	Burner motor	J	Fire protection system
C	not implemented	K	not implemented
D	not implemented	L	not implemented
E	Malfunction relay	M	Boiler cleaning motor
F	Flue gas fan	N	Boiler controlled pump RES2
G	Ash box motor	O	Suction turbine
H	Fuel transport system motor	P	Ignition

## 12.5 Parameter level 200

Parameter level 200 is exclusively for customer service technicians and MEco employees. You access parameter level 200 by entering the code in parameter P199. The code for parameter level 200 is the sum of day plus hour, e.g. : Day: **26/ 08/ 2009** and hour: **14:30:47**; (26 + 14 = 40) results in the code: 26 + 14 = **40**

You can use this parameter to adjust the function of the pellet heating system. Parameter level 200 has 99 values, from 200 – 299. Not all parameters are implemented. Parameters that are not used are also not displayed on the operating device.

There are adjustable parameters and non-adjustable parameters. Press Enter to switch adjustable parameters to edit mode.

### Note

The control system automatically switches back to the standard display if you do not make any entries for 30 minutes. After a further 30 minutes the backlight on the screen switches off.

### Changing a parameter

1. Select a parameter using the thumbwheel.
2. Press Enter
3. ►Parameter appears in brackets◀
4. Change the value of the parameter using the thumb wheel
5. Confirm by pressing Enter

### Note

Pressing Enter has no effect on non-adjustable parameters.

Description of parameter

Parameter	Display on screen	Description	Adjustable	Factory setting
P200	Level 1 P200: Enter	Press Enter to access level 1	no	
P202	Switch-off temp P202: 185°F	The boiler switches off when it reaches the switch-off temperature	yes	185
P203	Output test P203: Enter	Output test - using the thumbwheel you can select each individual output. Press Enter to switch the output on. The current power draw is shown for motors. Press again to switch the output off. The outputs for the flue gas fan and the air blower can be increased by 20% each time the button is pressed. Once you have reached 100%, the next press of the button returns the setting to 0%. Exit the output test menu at the bottom of the list.	yes	
P204	Malfunctions P204: Enter	Page through the malfunction fault text archive using the thumbwheel. When the alarm text archive is full, the next alarm text overwrites the oldest alarm text. Press Enter to return to the parameter level	no	
P205	Maintenance month P205: 0	Month in which the display indicates maintenance to be performed on boiler 0 – maintenance text deactivated	yes	0
P206	Maintenance day P206: 0	Day on which the maintenance message is displayed on the boiler. 0 – maintenance text deactivated	yes	0
P207	Flue gas temp Max P207: 238°F	Displays the highest flue gas temperature recorded so far; can be reset to 0.	yes	

P208	FRT limit ++ P208: 30%	Only enabled if parameter P270 combustion chamber temperature control is activated. If the combustion chamber temperature does not reach the setpoint, the duration for the burner auger switching on is increased by a maximum of this percentage.	yes	30
P209	FRT limit -- P209: 80%	Only enabled if parameter P270 combustion chamber temperature control is activated. If the combustion chamber temperature exceeds the setpoint, the duration for the burner auger switching on is reduced by a maximum of this percentage.	yes	80
P210	Cap. hopper active P210: 1	Here you can activate the capacitive sensor for the hopper on the suction system. If an auger with textile tank with oscillating floor is implemented, the capacitive sensor for the hopper is located on the excentric motor.	yes	1
P211	Cap. RA active P211: 0	Kap RA is always active at auger systems	yes	1
P212	Ash box P212: 0	Here you can activate the de-ashing system. If Parameter 212 is active, Parameter 213 is not displayed. If you have also an burner plate deashing system (optional for PE(S) 12–32) it runs with the de-ashing system. 0 = inactive, 1 = active  <b>Note</b> Does not start the boiler more than five days, on Friday 12.00 a.m. the de-ashing system runs for 3/5 minutes.	yes	0/0/1
P213	Deashing P213: 0	Here you can activate the burner plate deashing system 0 = inactive, 1 = active If Parameter 213 is active, Parameter 212 is not displayed	yes	0
P214	Neg. draft Min P214: 32EH	If the negative draft inside the combustion chamber falls below the minimum value for longer than 1 Minute (P217), the system switches to fault mode. Value = 0 negative draft supervision inactive. (Displayed only with negative draft measuring connected)	yes	32/32/45
P215	Neg. draft Max P215: 300EH	Maximum negative draft in combustion chamber. If this is exceeded for longer than 1 minute (P217), the system switches to fault mode. (Displayed only with negative draft measuring connected)	yes	300
P216	Neg. draft scrubber P216: 35EH	Min. negative draft of scrubber system only on condensing boiler systems. If the value falls below the minimum negative draft then the system switches to fault mode. If a value below 10 is set, the scrubber switches on according to the value set in P 193 and P 194.	yes	35
P217	Neg. draft time P217: 60s	If the negative draft inside the combustion chamber falls below the minimum value for longer than the set supervision time, the system goes to fault mode and displays "Negative draft".	yes	60
P218	Neg. draft setpoint P218: 60EH	If the negative draft in the combustion chamber falls below the setpoint, the speed of the flue gas fan is increased. If the negative draft increases then the speed of the flue gas fan is reduced again. Value = 0, negative draft supervision inactive. (Displayed only with negative draft measuring connected)	yes	60

P221	Min. downtime P221: 60m	The electronic ignition is not activated if the burner attempts to start within the set duration after the last burner stop.	yes	60
P222	Auger dur. ign P222: 50zs	Running duration of burner auger during the ignition phase, specified in tenths of a second	yes	50
P223	Auger pause ign P223: 20zs	Pause duration of burner auger during the ignition phase, specified in tenths of a second	yes	20
P224	Fan rpm ign P224: 100%	Speed of burner fan during ignition phase.	yes	100
P225	Suction ign P225: 100%	Speed of flue gas fan during ignition phase.	yes	100
P226	Hyst. flue temp. P226: 50°F	For ignition to take place successfully, the flue gas temperature must exceed the boiler temperature by Hyst. flue gas temperature.	yes	50
P228	Combustion ch. min. P228: 248°F	Setpoint of combustion chamber temperature for successful ignition. Combustion chamber temperature 248°F, only when combustion chamber sensor is active P270	yes	248
P229	Fan run on P229: 420s	Minimum run on time (seconds) of burner fan after switching off.	yes	420
P230	AGT++LL off P230: 58°F	After the minimum run on time has expired, the combustion air fan continues to run until the flue gas temperature is lower than the boiler temperature + the temperature value set: e.g.: boiler temperature = 169°F + 58°F = 227°F switch-off temperature.	yes	58
P231	AGT++ SZ off P231: 22°F	After the minimum run on time has expired, the flue gas fan continues to run until the flue gas temperature is lower than the boiler temperature + the temperature value set: e.g.: boiler temperature = 169°F + 22°F = 191°F switch-off temperature.	yes	22
P233	P233: 0	Activation of the level detection system 1.....Level detection system using weighing cells for FleXILO textile tanks. 2.....Level detection system using weighing cells at the hopper for storage rooms. 3.....Level detection system using a capacitive sensor for storage rooms and FleXilo textile tanks.		
P234	P234: 0 kg	Displayed only, if P233 is 1. Set the display of the current weight to 0 by putting in the negative of the current weight shown in P 132. Therefore you have to turn the thumbweel left.		
P235	P235: 0 kg	Displayed only, if P233 is 2. Set the display of the current weight to 0 by putting in the negative of the current weight of the hopper shown in P 132. Therefore you have to turn the thumbweel left.		



P236	CF Logger P236: 0	<p>Activates the data logger on the CF card. This can only be activated if a CF card is located in the relevant socket. Display:</p> <ul style="list-style-type: none"> <li>-1 – no CF card in socket 0 CF card in socket, logger not active</li> <li>1 – CF card in socket and logger program is running</li> </ul> <p>Records the current status and malfunctions of KT, RGT, FRT, ES, PA, LL, SZ, UP providing sensors are connected. (Displays parameters only with CF card)</p>	yes	0
P237	Sample time P237: 60s	The recording interval of the data archive in seconds (displays parameters only with CF card)	yes	60
P238	Param. -> CF P238: 0	Outputs the current parameter values of the CF card. The file name is the 5-figure PLC number (Pxxxxx_0.csv). This is marked on the label in the CF socket. (Display only with CF card inserted)	yes	0
P239	CF -> Param. P239: 0	<div style="background-color: #0070C0; color: white; text-align: center; padding: 5px;"><b>NOTICE</b></div> <p><b>Damage to property</b> Do not change the format of the output file from "Startkennung &amp;&amp;&amp;" onwards. You may only change the numerical values. Do not enter any new lines, no semi-colons, spaces or other characters. The values are checked for plausibility, not for parameter numbers. (Display only with CF card inserted)</p> <p>Reads in the parameter values from the CF card. The file name must be the 5-figure PLC number (Pxxxxx_0.csv). This is marked on the label in the CF socket and in parameter P101. The best method is to write data to the CF card using P238 – then edit the export file in Excel or a text editor and then read the data in again. You can insert comments such as the customers name and any special lines of code in front of the text "Startkennung &amp;&amp;&amp;". Exception: you cannot use "&amp;"</p>	yes	0
P242		<p>Enable and disable the outdoor sensor with parameter P242</p> <p>PT1000 outdoor sensor at the place of the PT1000 RGF Sensor Input at:</p> <p>-Outside temp. . &gt;59°F set value P263: 158°F Stop temp. P202: P263+11°F</p> <p>-41°F &lt; Outside temp. &lt;=59°F set value P263: 176°F Stop temp. P202: P263+11°F</p> <p>-32°F &lt; Outside temp. &lt;=41°F set value P263: 183°F Stop temp. P202: P263+11°F</p> <p>-14°F &lt; Outside temp. &lt;=32°F set value P263: 183°F Stop temp. P202: P263+11°F</p> <p>—Outside temp. &lt;14°F set value P263: 192°F Stop temp. P202: P263+11°F</p> <p>The parameter Boiler Set t + + / P264 (= correction factor to control temperature), serves to change additionally the set value in the range of +10 to -9 ° (move temperature curve) for example: outside temp. = 28 ° F and parameter P264 +2 ° F</p> <p>set value= 185°F (183°F+2°F)</p>		



P243		Setting of the heating limit of the boiler. (visible when P242 to 1) Default = 68 ° F, adjustable from 23 ° F to 95 ° F. If the Outside temperature is higher than the heating limit no burner request.		
P250	Run time BSK P250: 247 h	Operating hours counter for fire protection system.	no	
P251	No. ignition P250: 283x	Displays the number of ignitions with electronic ignition system.	no	
P260	Burner auger ++ P260: 0zs	Adjust the running duration of the burner motor during heating at full power. Specified in tenths of a second (displays parameter only if combustion chamber temperature controller is inactive, P270 = 0)	yes	0
P261	Air flow rate ++ P261: 0%	Adjust the speed of the burner fan during heating at full power.	yes	0
P262	Draft ++ P262: 0%"	Adjust the speed of the flue gas fan during heating at full power.	yes	0
P263	Boiler set temp P263: 175°F	Adjust the boiler set point temperature.	yes	175
P264	Boiler set t++	The parameter P264 causes an external sensor. The parameter P263 is the reference of the controlled temperature and consists of the value of the external sensor and compensation value parameter P264. With parameter P264 you can raise or lower the set point of the external sensor to +10 to -9 ° F, that means you move the start point of the temperature curve. Example: Outside temperature: 28 ° F Correction Parameter P264: +2 ° F Reference Parameter P263: 30 ° F		
P265	Power level P265: level 15	Adjust the boiler power rating: 1 level = 3.412 BTU/hr, e.g.: level 15 = 51,000 BTU/hr	yes	15/25/36
P266	FRT++ P266: 0°F	Setpoint for controlling the combustion chamber temperature (displays only with activated FRT controller – P 270 = 1)	yes	0
P267	Amplify P267: 40%	P proportion for controlling combustion chamber temperature (displays only with activated FRT controller – P 270 = 1)	yes	40
P268	Reset time P268: 200s	I proportion for controlling combustion chamber temperature (displays only with activated FRT controller – P 270 = 1)	yes	200
P269	Derivative time P269: 20zs	D proportion for controlling combustion chamber temperature (displays only with activated FRT controller – P 270 = 1)	yes	20
P270	FRT controller P270: 0	The combustion chamber temperature controller can only be activated with the combustion chamber temperature sensor connected. 1 = active 0 = inactive	yes	0
P272	Gain SZ P272: 40%	P proportion for negative draft control in combustion chamber temperature (displays only with connected negative draft controller)	yes	40

P273	Reset time SZ P273: 10s	I proportion for negative draft control in combustion chamber temperature (displays only with connected negative draft controller)	yes	10
P274	Derivative SZ P274: 2 zs	D proportion for negative draft control in combustion chamber temperature (displays only with connected negative draft controller)	yes	2
P280	Run on RES2 P280: 15m	Run on time for boiler controlled pump after burner switches off - in minutes	yes	15
P281	Boiler min. temp. P281: 140°F	Switch-on temperature from boiler-controlled pump output	yes	140
P282	Boiler min. hyst. P281: 5°F	Hysterisis for boiler minimum temperature	yes	5
P283	Control range RES2 P283: 9°F	Control range of output from boiler-controlled pump. The control range starts at the minimum boiler temperature with a speed of 30% and increases to the boiler minimum temperature + control range to 100% speed.	yes	9
P284	Min speed AV P284: 2	Is the minimum speed of the ash auger in rounds per minute. If the ash auger turns less than 2 rounds per minute, the warning message appears on the operating device.	yes	2
P285	Suction int. setpoint P295: 175	Burner run time in minutes until filling hopper.	no	175/200/100
P293	Pellematic P293: 1	Boiler code for cascade connection. It only changes when 2, 3 or 4 Pellematic plugs are plugged in for a cascade system of pellet boilers.	no	1
P294	Hand filling hopper P294: 0	Set whether pellet boiler is installed as boiler with hand filling hopper. 0 = inactive, 1 = active  <b>Note</b> This parameter is only shown with auger delivery system.	yes	0
P295	Delete alarm P295: 0	You can delete the alarm archive (P204).  <b>Note</b> Parameter is automatically reset to 0	yes	0
P296	Motor code P296: 0	A motor remains active until the motor detection starts again. If a motor is connected incorrectly, you can deactivate it again.  <b>Note</b> Parameter is automatically reset to 0	yes	0
P297	CF card format P297: 0	Format a Compact Flash card. Press Enter to select edit mode. Use menu scroll to set value 1. The formatting process starts. After a short time (1 second) value 1 returns to 0. Formatting finishes. The format process deletes everything on the CF card.	yes	0
P298	Standard param P298: 0	Load standard parameters (default values). Use the menu scroll to set the value to 1. The standard parameters are loaded. After a short time (1 second) value 1 returns to 0. The parameter loading process finishes. All parameters in levels 100, 200 and 300 are now set to the factory settings.	yes	0
P299	Level 3 passw. P299: 0	Access level 3 - level for MEco technical department, enter password	no	

## 12.6 List of adjustable parameters

Use this list to enter all changes to factor settings, plus the date the changes were made. Documenting the settings provides a record of changes made to the system.

### Parameter list

Parameter	Factory setting			Display on screen only if:	Parameter changes					
	PE(S) 12–20	PE(S) 25–32	PES 36–56		Change and date		Change and date		Change and date	
P130	212	212	212	Flue gas sensor is installed						
P131	212	212	212	Flue gas sensor is installed						
P160	0	0	0							
P161	60	60	60	not cap. RA or cap. ZW						
P170	0	0	0							
P171	0	0	0							
P172	20	20	20	P171 = 3						
P173	1	1	1	P171 = 3						
P180	2	2	2							
P183	6	6	6							
P187	60	60	60	on a vacuum-type system						
P188	0	0	0	on a vacuum-type system						
P189	-1	-1	-1							
P190	20	20	20							
P191	12	12	12							
P192	120	120	120							
P193	6	6	6							
P194	45	45	45							
P195	120	80	45	with external de-ashing system						
P196	3	3	5	with external de-ashing system						
P202	185	185	185							
P208	30	30	30	only with FRT						
P209	80	80	80	only with FRT						
P210	1	1	1	vacuum = 1						
P211	0	0	1	always active at auger systems						
P212	0	0	1							
P213	0	0	0	not implemented						
P214	32	32	45	with low pressure sensor						
P215	300	300	300	with low pressure sensor						
P216	35	35	35	with low pressure sensor						
P217	60	60	60	with low pressure sensor						
P218	60	60	60	with low pressure sensor						

P221	60	60	60							
P222	50	50	50							
P223	20	20	20							
P224	100	100	100							
P225	100	100	100							
P226	50	50	50							
P228	122	122	122							
P229	420	420	420							
P230	32	32	32							
P231	22	22	22							
P260	0	0	0	no FRT or P170 = 0						
P261	0	0	0							
P262	0	0	0							
P263	175	175	175							
P265	15	25	36							
P266	0	0	0	FRT - control P270 = 1						
P267	20	20	20	FRT - control P270 = 1						
P268	200	200	200	FRT - control P270 = 1						
P269	20	20	20	FRT - control P270 = 1						
P270	0	0	0	combustion chamber sensor (FRT) is installed						
P272	40	40	40	P218 larger 1 EH						
P273	10	10	10	P218 larger 1 EH						
P274	2	2	2	P218 larger 1 EH						
P280	15	15	15							
P281	140	140	140							
P282	5	5	5							
P283	9	9	9							
P284	2	2	2	de-ashing system is installed						
P285	175	250	100	vacuum-type system						
P293	1	1	1							
P294	0	0	0	auger system						

## 13 Malfunctions

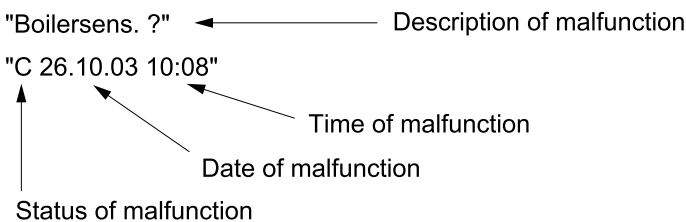
### 13.1 Malfunctions - what to do

Follow the sequence described for handling malfunctions.

- The heating system switches off automatically if a malfunction occurs.
- The control unit display shows a malfunction alarm text.
- You have to rectify the cause of the malfunction.
- After rectifying the malfunction, you have to reset the fault text by pressing Enter before starting the heating system again.

### 13.2 Malfunction texts

The malfunction text displayed on the screen provides information on the type, time and status of the malfunction as well as help for troubleshooting.



Malfunction texts have 3 statuses

1. C – New malfunction: when the malfunction comes.
2. G – Rectified malfunction: when the malfunction goes.
3. Q – Reset malfunction: when the malfunction quits.

Being able to trace the sequence of malfunctions will help you to establish the cause of the malfunction.

### 13.3 Overview of malfunction alarm texts

This is a list of all malfunction alarms that are displayed

**Table 13.1 Boiler sensor**

Display:	<b>Boiler S fr</b>		
Description:	Boiler sensor fracture, measuring circuit from boiler sensor is open		
Cause and Remedy:	sensor not connected	▶	connect sensor at input
	sensor defect	▶	measure sensor (approx. 2kΩ at 77°F) replace if required
	sensor cable defect	▶	replace sensor
	signal input defect	▶	change CMP PLC
	sensor temp. too high	▶	sensor temperature above measuring range (230°F)
Display:	<b>Boiler S sh-c</b>		
Description:	Boiler sensor short circuit, measuring circuit from boiler sensor is shorted out		
Cause and Remedy:	sensor defect	▶	measure sensor (approx. 2kΩ at 77°F) replace if required
	sensor cable defect	▶	replace sensor
	signal input defect	▶	change CMP PLC
	sensor temperature too low	▶	sensor temperature below measuring range (14°F)

**Table 13.2 Flue gas sensor**

Display:	<b>Flue gas S fr</b>		
Description:	Flue gas sensor fracture, measuring circuit from flue gas sensor is open		
Cause and Remedy:	sensor not connected	▶	connect sensor at input
	sensor defect	▶	measure sensor (approx. 1kΩ at 32°F) replace if required
	sensor cable defect	▶	replace sensor
	signal input defect	▶	change CMP PLC
	sensor temp. too high	▶	sensor temperature above measuring range (752°F)
Display:	<b>Flue gas S sh-c</b>		
Description:	Flue gas sensor short circuit, measuring circuit from flue gas sensor is shorted out		
Cause and Remedy:	sensor defect	▶	measure sensor (approx. 1kΩ at 32°F) replace if required
	sensor cable defect	▶	replace sensor
	signal input defect	▶	change CMP PLC
	sensor temperature too low	▶	sensor temperature below measuring range (14°F)

**Table 13.3 Combustion chamber sensor**

Display:	<b>Comb S fr</b>		
Description:	Combustion chamber sensor fracture, measuring circuit from combustion chamber sensor is open		
Cause and Remedy:	sensor not connected	▶	connect sensor at input
	sensor defect	▶	Measure sensor (approx. 5mV at 257°F) replace if required
	sensor cable defect	▶	replace sensor
	signal input defect	▶	change CMP PLC
	sensor temp. too high	▶	sensor temperature above measuring range (2012°F)
Display:	<b>Comb S sh-c</b>		
Description:	Combustion chamber sensor short-circuit, measuring circuit from combustion chamber sensor is shorted out		
Cause and Remedy:	sensor defect	▶	Measure sensor (approx. 5mV at 257°F) replace if required
	sensor cable defect	▶	replace sensor
	signal input defect	▶	change CMP PLC
	sensor temperature too low	▶	sensor temperature below measuring range (14°F)
	sensor polarity incorrect	▶	exchange + and – connections

**Table 13.4 Negative draft measurement**

Display:	<b>UP open</b>		
Description:	Negative draft input open, measuring circuit from negative draft measurement open		
Cause and Remedy:	signal incorrect	▶	check polarity and signal (0-10V)
	signal cable defect	▶	replace sensor
	signal input defect	▶	change CMP PLC
	signal too low	▶	signal below 0V
	combustion chamber leak	▶	check closure of boiler door

Display:	<b>UP sh-c</b>		
Description:	Negative draft input short-circuit, measuring circuit from negative draft measurement is shorted out		
Cause and Remedy:	signal wrong	▶	check polarity and signal (0-10V)
	signal cable defect	▶	replace sensor
	signal input defect	▶	change CMP PLC
	signal too high	▶	signal above 10V

**Table 13.5 Analog input 2**

Display:	<b>An. input open</b>		
Description:	Analog input 2 open, measuring circuit from analog input open		
Cause and Remedy:	signal incorrect	▶	check polarity and signal (0-10V)
	signal cable defect	▶	repair/replace cable
	signal input defect	▶	change CMP PLC
	signal too low	▶	signal below 0V
Display:	<b>An. input 2 sh-c</b>		
Description:	Analog input 2 short-circuit, measuring circuit from analog input is shorted out		
Cause and Remedy:	signal incorrect	▶	check polarity and signal (0-10V)
	signal cable defect	▶	repair/replace cable
	signal input defect	▶	change CMP PLC
	signal too high	▶	signal above 10V

**Table 13.6 Controller sensor**

Display:	<b>Control S fr</b>		
Description:	Controller sensor fracture, control system sensor on boiler control system is used as reference for combustion chamber sensor		
Cause and Remedy:	signal input defect	▶	change CMP PLC
	temperature too high	▶	temperature above 158°F
Display:	<b>Control S sh-c</b>		
Description:	Controller sensor short-circuit, control system sensor on boiler control system is used as reference for combustion chamber sensor		
Cause and Remedy:	signal input defect	▶	change CMP PLC
	temperature too low	▶	temperature below 14°F

**Table 13.7 Ignition and flame supervision**

Display:	<b>Ignition malf</b>		
Description:	Flue gas minimum temperature not reached during ignition phase		
Cause and Remedy:	no pellets available	▶	fill up with pellets
	ignition electrode defect	▶	check ignition electrode (approx. 200Ω) replace if required
	ignition nozzle blocked	▶	clean burner plate and ignition tube
	flue gas sensor contaminated	▶	clean flue gas sensor and flue gas tube
	flue gas sensor is not in flue gas tube	▶	insert flue gas sensor into flue gas tube

Display:	<b>Flame contr malf</b>		
Description:	Flame supervision fault, minimum flue gas temperature not reached during heating up at full power		
Cause and Remedy:	no pellets available	►	fill up with pellets
	flue gas sensor contaminated	►	clean flue gas sensor and flue gas tube
	power is too low	►	increase boiler power rating

**Table 13.8 Fire protection**

Display:	<b>Fire prot sys op</b>		
Description:	Fire protection system open malfunction.		
Cause and Remedy:	Fire protection motor gate unplugged	►	Connect up fire protection system and check cable connections
	Fire protection motor does not reach OPEN limit switch	►	check ball valve to see if it is jammed
	no signal although open	►	check cables and fire protection system
Display:	<b>Fire prot sys cl</b>		
Description:	Fire protection system closed malfunction.		
Cause and Remedy:	fire protection system unplugged	►	connect up fire protection system and check cable connections
	fire protection system does not reach CLOSE limit switch	►	check whether ball valve is jammed, check ball valve throughway to see if foreign objects are preventing it from closing
	no signal although closed	►	check cables and fire protection system
Display:	<b>Fire prot sys</b>		
Description:	Both fire protection motor limit switches are closed at the same time		
Cause and Remedy:	both limit switches activated	►	check fire protection system, check cables, check connectors

**Table 13.9 Negative draft supervision**

Display:	<b>Negative draft</b>		
Description:	Negative draft in boiler is not achieved		
Cause and Remedy:	negative draft tube disconnected	►	connect up negative draft tube
	negative draft does not change	►	check negative draft tube for leaks. Check flue gas tube for blockage.
	negative draft pressure too low	►	close boiler door, check tube to negative draft sensor, check whether boiler flue gas outlet is clear, check whether condensation heat exchanger is clear. Make sure flue gas fan is running.

**Table 13.10 Suction system**

Display:	<b>Suction system</b>		
Description:	Hopper cannot be filled up even after 3 suction cycles		
Cause and Remedy:	storage room empty	►	fill up with pellets
	extraction system is blocked	►	clear extraction system
	extraction system not conveying pellets	►	pellet bridge - destroy bridge and make sure material flows properly



	suction fan unplugged	▶	connect up suction fan
	fuse on suction fan defective	▶	replace fuse
	storage room auger motor unplugged	▶	connect up storage room motor

**Table 13.11 Motors**

Display:	<b>Burner motor</b>		
Description:	Burner motor malfunction		
Cause and Remedy:	motor unplugged	▶	plug in motor, check cable connections
	motorpower too high	▶	too low adjusted, motor sticks or is defective
	motorpower too low	▶	too high adjusted, motor sticks or is defective
	motor is sticking		remove the pellets from the burner auger, make the motor easy-running
	motor defective	▶	replace motor
Display:	<b>Suction turb</b>		
Description:	Suction turbine malfunction		
Cause and Remedy:	motor unplugged	▶	plug in motor, check cable connections
	motor defect	▶	replace motor
	fuse –F1 of the suction circuit board is defective	▶	replace fuse –F1of the suction of the suction circuit board
	fire protection system does not reach CLOSE limit switch	▶	check whether ball valve is jammed, check ball valve throughway to see if foreign objects are preventing it from closing
Display:	<b>Fuel trans sys M</b>		
Description:	Storage room auger 1 motor malfunction		
Cause and Remedy:	motor unplugged	▶	plug in motor, check cable connections
	motor is jammed	▶	remove pellets from auger and make sure auger rotates freely
	fuse –F2 of the suction circuit board is defective	▶	replace fuse –F2 of the suction circuit board
	motor defect	▶	replace motor
	fuse defect	▶	replace fuse
Display:	<b>Ignition</b>		
Description:	Ignitions stick malfunction		
Cause and Remedy:	ignition stick unplugged	▶	plug in ignition stick, check cable connections
	power too high	▶	too low adjusted, ignition stick is defective
	power too low	▶	too high adjusted, ignition stick is defective
	motor defective	▶	check the resistance to see if the ignition stick is defective or not (0, 400 and ~ = ignition stick is defective, all other values = ignition stick is not defective), replace ignition stick
Display:	<b>Burner fan</b>		
Description:	Burner fan malfunction		
Cause and Remedy:	motor unplugged	▶	plug in motor, check cable connections

	power too high	▶	too low adjusted, motor sticks or is defective
	power too low	▶	too high adjusted, motor sticks or is defective
	motor is sticking		make the motor easy-running
	motor defective	▶	replace motor
Display:	<b>Flue gas fan</b>		
Description:	Flue gas fan malfunction		
Cause and Remedy:	motor unplugged	▶	plug in motor, check cable connections
	power too high	▶	too low adjusted, motor sticks or is defective
	power too low	▶	too high adjusted, motor sticks or is defective
	motor is sticking		check and clean the flue gas tube, make the motor easy-running
	motor defective	▶	replace motor
Display:	<b>Boiler clean M</b>		
Description:	Boiler cleaning motor malfunction		
Cause and Remedy:	motor unplugged	▶	plug in motor, check cable connections
	power too high	▶	too low adjusted, motor sticks or is defective
	power too low	▶	too high adjusted, motor sticks or is defective
	motor is sticking		make the motor easy-running
	motor defective	▶	replace motor
Display:	<b>Ash box M</b>		
Description:	Ash box motor malfunction		
Cause and Remedy:	motor unplugged	▶	plug in motor, check cable connections
	power too high	▶	too low adjusted, motor sticks or is defective
	power too low	▶	too high adjusted, motor sticks or is defective
	motor is sticking		make the motor easy-running
	motor defective	▶	replace motor
Display:	<b>Hopper motor</b>		
Description:	Hopper motor malfunction		
Cause and Remedy:	motor unplugged	▶	plug in motor, check cable connections
	power too high	▶	too low adjusted, motor sticks or is defective
	power too low	▶	too high adjusted, motor sticks or is defective
	motor is sticking		make the motor easy-running
	motor defective	▶	replace motor

**Table 13.12 Magnetic valve**

Display:	<b>Magnetic valve</b>		
Description:	Magnetic valve malfunction		
Cause and Remedy:	motor unplugged	▶	plug in motor, check cable connections
	power too high	▶	too low adjusted, motor sticks or is defective
	power too low	▶	too high adjusted, motor sticks or is defective
	motor defective	▶	replace motor

**Table 13.13 Boiler controlled pump**

Display:	<b>Boiler contr P</b>		
Description:	Boiler controlled pump malfunction		
Cause and Remedy:	pump unplugged	▶	plug in pump, check cable connections
	power too high	▶	too low adjusted, pump sticks or is defective
	power too low	▶	too high adjusted, pump sticks or is defective
	pump is sticking		make the pump easy-running
	pump defective	▶	replace pump

**Table 13.14 Safety temperature limiter and Low H2O / —F1**

Display:	<b>Safety T sys</b>		
Description:	Safety temperature limiter has tripped		
Cause and Remedy:	safety temperature limiter unplugged	▶	connect up safety temperature limiter and check cable connections
	safety temperature limiter has tripped	▶	check boiler controller
	safety temperature limiter defect	▶	allow boiler to cool and reset alarm
Display:	<b>Low H2O/ – F1</b>		
Description:	Low H2O has been actuated		
Cause and Remedy:	low H2O unplugged	▶	connect up low H2O and check cable connections
	low H2O button has been pressed	▶	reset low H2O switch
	low H2O defect	▶	replace low H2O switch
	fuse –F1 of controller defective	▶	replace fuse –F1 of controller

**Table 13.15 Wrong system**

Display:	<b>Wrong system</b>		
Description:	The wrong program has been saved to the boiler controller		
Cause and Remedy:	wrong program	▶	upload and save the correct program to the boiler controller — see appendix

**Table 13.16 External de-ashing system (optional)**

Display:	<b>Ash box full</b>		
Description:	The alarm text "Ash box full" is displayed after the motor has made 3 unsuccessful attempts to reach the normal speed of the external de-ashing system.		
Cause and Remedy:	Ash box is full	▶	Empty ash box, reset alarm text by pressing Enter. The status of the boiler is displayed on screen.
	Ash box is not securely mounted	▶	Check position of ash box and adjust if required.

# 14 Appendix

## 14.1 Checklist for checking the heating system

The checklist is intended to help authorised specialists perform and document a comprehensive check on the heating system.

<b>Name and address of the customer</b>	<b>Heating device</b>
Name:	Type of boiler:
Street:	Rated power:
Place:	Year of build:
<b>Name and address of the seller</b>	Manufacturer's serial number:
Name:	Type of heating controller:
Street:	Type of accumulator:
Place:	Solar device:

### NOTICE

#### Damage to property

Use the checklist to check the heating system before starting up for the first time.

CHECKLIST		Yes	Comment
<b>Textile tank</b>			
Textile tank	Are the tie members installed?		
	Are all stayers straightened vertical?		
Delivery unit	Is the slot for the emergency gate valve closed with an adhesive tape?		
Filling coupling	Are the filling couplings correctly installed?		
	Are the plugs at the filling couplings?		
	Are the safety labels placed? (Caution – Switch off the heating system before entering)		
	Are the couplings correctly grounded?		
Aeration	Exists the required aeration opening of 27 inch <sup>2</sup> for the storage room?		
Caution label	Is the label "Wood pellets storage room" placed on the door to the storage room?		
Vibration plate	Check the electrical connection of the vibration motor and the capacitive sensor		
<b>If auger delivery system is installed</b>			
Drive unit	Is the direction of rotation correct?		
	Is a demounting possible?		
Spiral hose	Is the pitch to the burner > 45°?		
Sound insulation	Is the rock wool insulation fix at the wall duct?		
<b>Pellet boiler</b>			
Adjusting power rating	Is the power rating correctly adjusted?		
Burner plate	Is the screw fixing the burner plate, tightened?		

Flame tube	Is the flame tube placed correctly?		
Combustion chamber cover	Are the adjusting screws for the increasing of the flue gas temperature adjusted correctly?		
Flue gas connection	Is a chimney draft regulator, barometric damper implemented?		
Airation/boiler room	Does the boiler room have required make-up air?		
Nameplate	Is the nameplate placed on the boiler?		
<b>Electric installation and regulation</b>			
Power supply	Check the electrical connection? (terminal box)		
	Check the dimensions of the fuses.		
Settings-Boiler control unit	Are the settings of the boiler control unit according to the installation manual?		
Settings-Heating controller	Set the parameters, the heating circuit program and domestic hot water program.		
Boiler sensor	Securing location and connection – <a href="#">10.2.2 Cable routing, page 41</a>		
<b>Hydraulic Connection</b>			
Circuit pumps	Check the switch on temperature (min. 140°F ) for boiler controlled pump (Parameter P 281).		
Low Water Cut Off	Is a low water cut off installed? (terminal box)		
	Test low water device		
Boiler connection	Is the pellet boiler correctly connected		
	Is the hydraulic system free of air?		
	Is the system filled up with water? Check the pressure.		
<b>Safety systems</b>			
Fire protection - ball valve	Check the function?		
Safety temp. sensor	Check the installation and explain the function. Securing location and connection – <a href="#">10.2.2 Cable routing, page 41</a>		
Negativ draft control	Check the function.		
Safety valve	Is a safety valve installed?		
Emergency stop switch	Is there an emergency stop switch?		
Fire extinguisher	Is there a fire extinguisher?		
<b>Instruction</b>			
Heating-up	Explanation of functions, malfunctions and maintenance to the customer.		
Heating controller	Explanation of the heating controller.		
Operating manual	Explanation of the operating and maintenance regulations to the customer.		
Maintenance contract	Notice to the legal regulations;		

**Date:** \_\_\_\_\_

**Signature authorized technician:** \_\_\_\_\_

**Signature customer:** \_\_\_\_\_

The customer confirms that he got enough information about operation and maintenance of the heating plant.

## 14.2 Appendix G of CAN/CSA-B365–M91

### Functioning of safety and operating controls

This Annex is not a mandatory part of this Standard, but is written in mandatory language to accommodate its adaption by anyone wishing to do so.

The safety and operating controls shall function within the limits specified by the manufacturer for the type of equipment. The following test shall be performed:

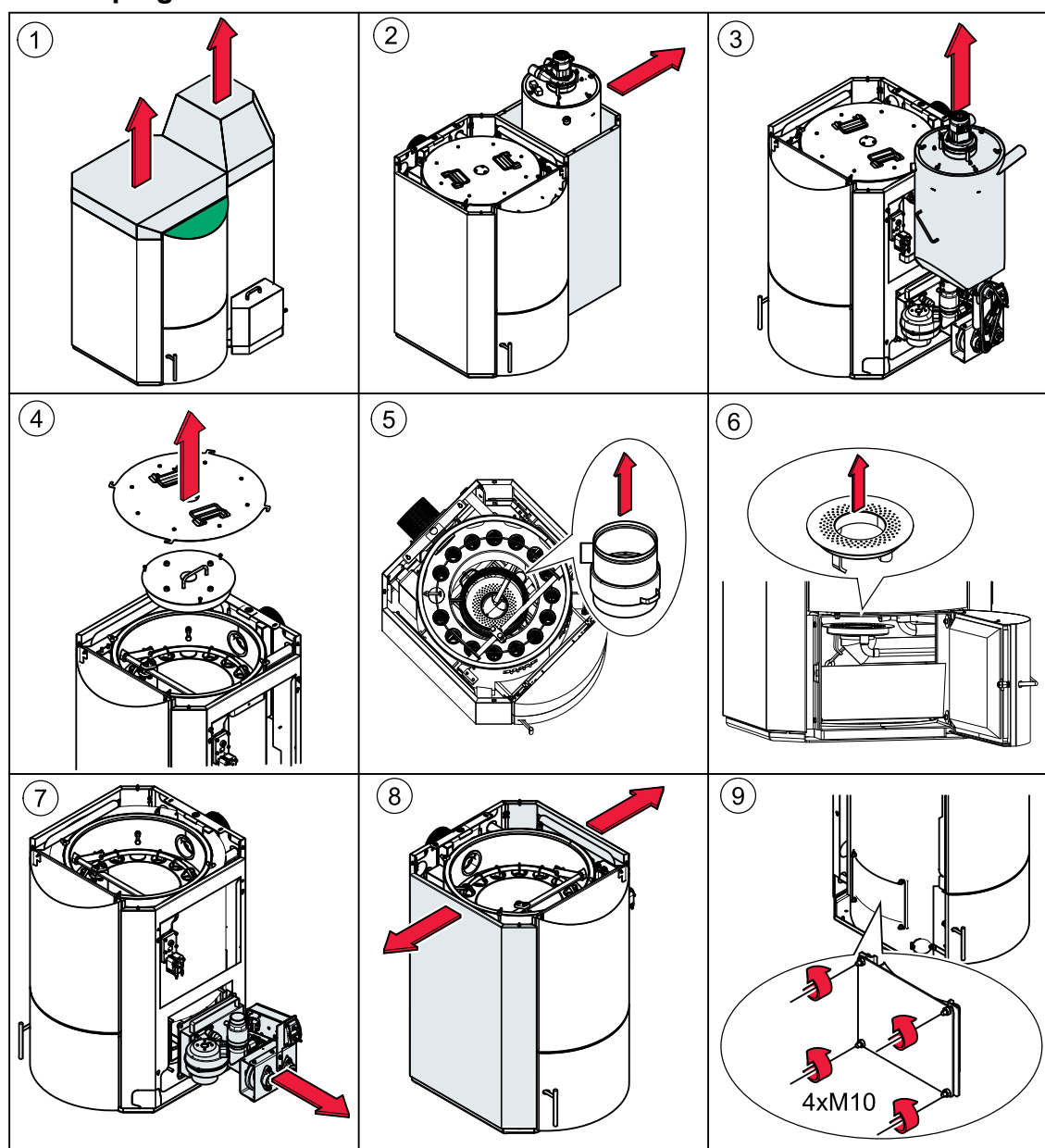
1. Check the operation of the automatic fuel\_feeding interrupt device at each entrance to the floor space within which the fuel-feeding device is installed.
2. Check that when the low water level control on steam and hot water boilers is operated to indicate a low water level, the automatic fuel-feed is interrupted.
3. Check that when the excessive pressure control on steam and hot water boilers is operated as in an excessive pressure situation, the automatic fuel-feed is interrupted.
4. Check that when the excessive water temperature control on steam and hot water boilers is operated to indicate excessive water temperature, the automatic fuel-feed is interrupted and, if appropriate, that one or more zone control valves open.
5. Check that if the temperature exceeds 200°F in a furnace supply plenum on hot air furnaces, the automatic fuel-feed is interrupted.
6. Check that if there is a failure of the fan providing combustion air, the automatic fuel-feed is interrupted.
7. Check that if there is a failure of the combustion air supply control mechanism to remain fully open, the automatic fuel-feed is interrupted.
8. Check that when the hot water circulating pump manual disconnect switch is opened, the automatic fuel-feed is interrupted.
9. Check that if there is a shutdown or failure of the mechanical flue-gas exhauster, the automatic fuel-feed is interrupted.
10. Check that if there is a failure in the flue gas flow, the automatic fuel-feed is interrupted, or the combustion air supply is shut off in manually fuelled appliances.
11. Check for the proper operation of the minimum fire maintenance controls and system or, if applicable, of the automatic ignition system.
12. Check for the proper operation of the controls used for normal automatic fuel-feeding.
13. Check the operation of any other controls supplied on the appliance by the manufacturer, or required by the authority having jurisdiction.

## 14.3 Modifying the burner

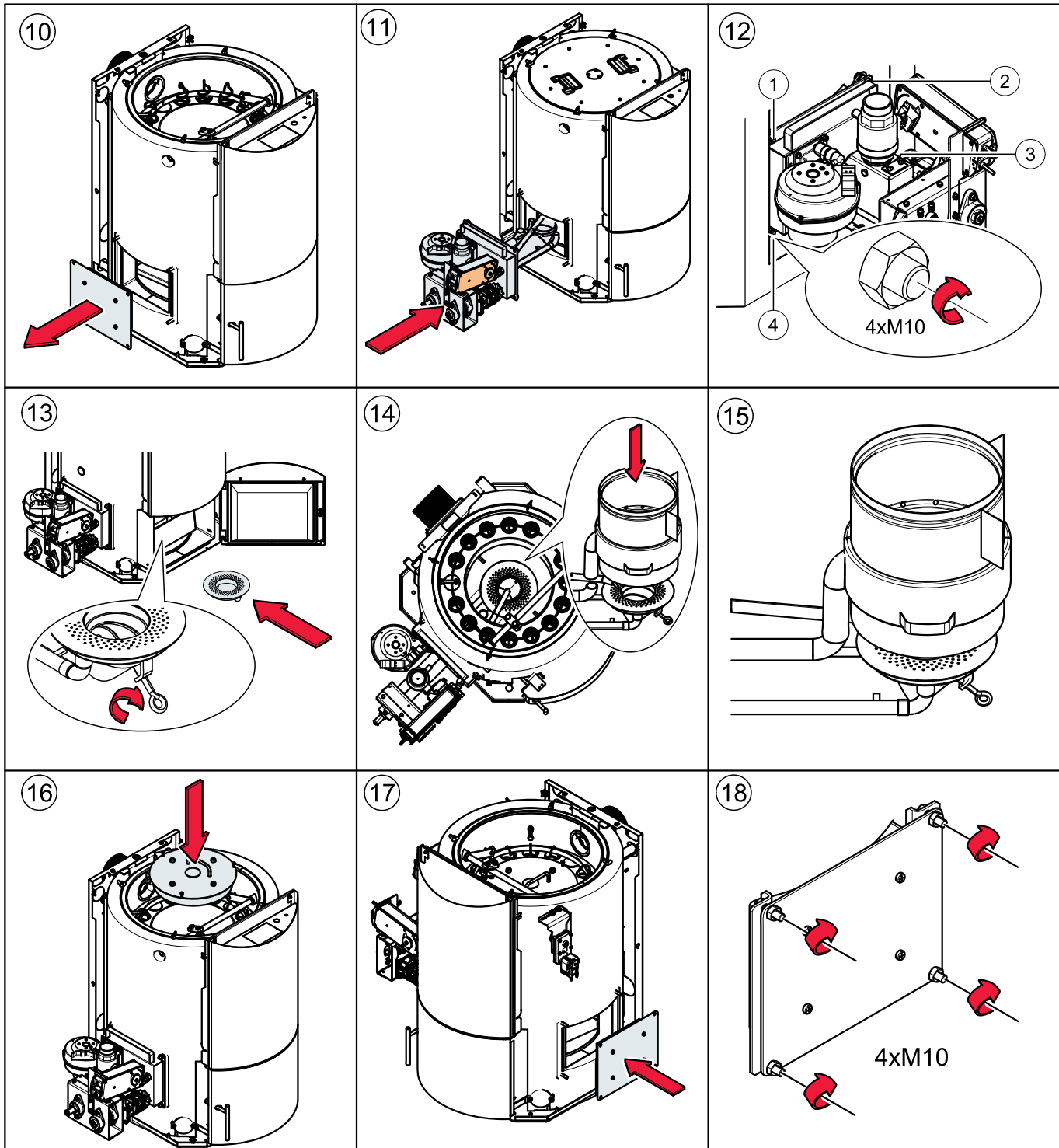
The pellet boiler is configured symmetrically. If required, you can remove the burner from the right-hand side (as shipped) and reinstall it on the left.

1. Dismantle the casing, hopper, combustion chamber lid, flame tube, burner and burner plug.
2. Modify the burner on the left.
3. Modify the cleaning system motor and off-set disc.
4. Change the direction of rotation of the cleaning motor.
5. Modify and re-assemble the cleaning system.
6. Route cables through cutouts to the boiler controller and connect up the plug.

### 14.3.1 Dismantling the casing, hopper, combustion chamber lid, flame tube, burner and burner plug



## 14.3.2 Modify the burner on the left

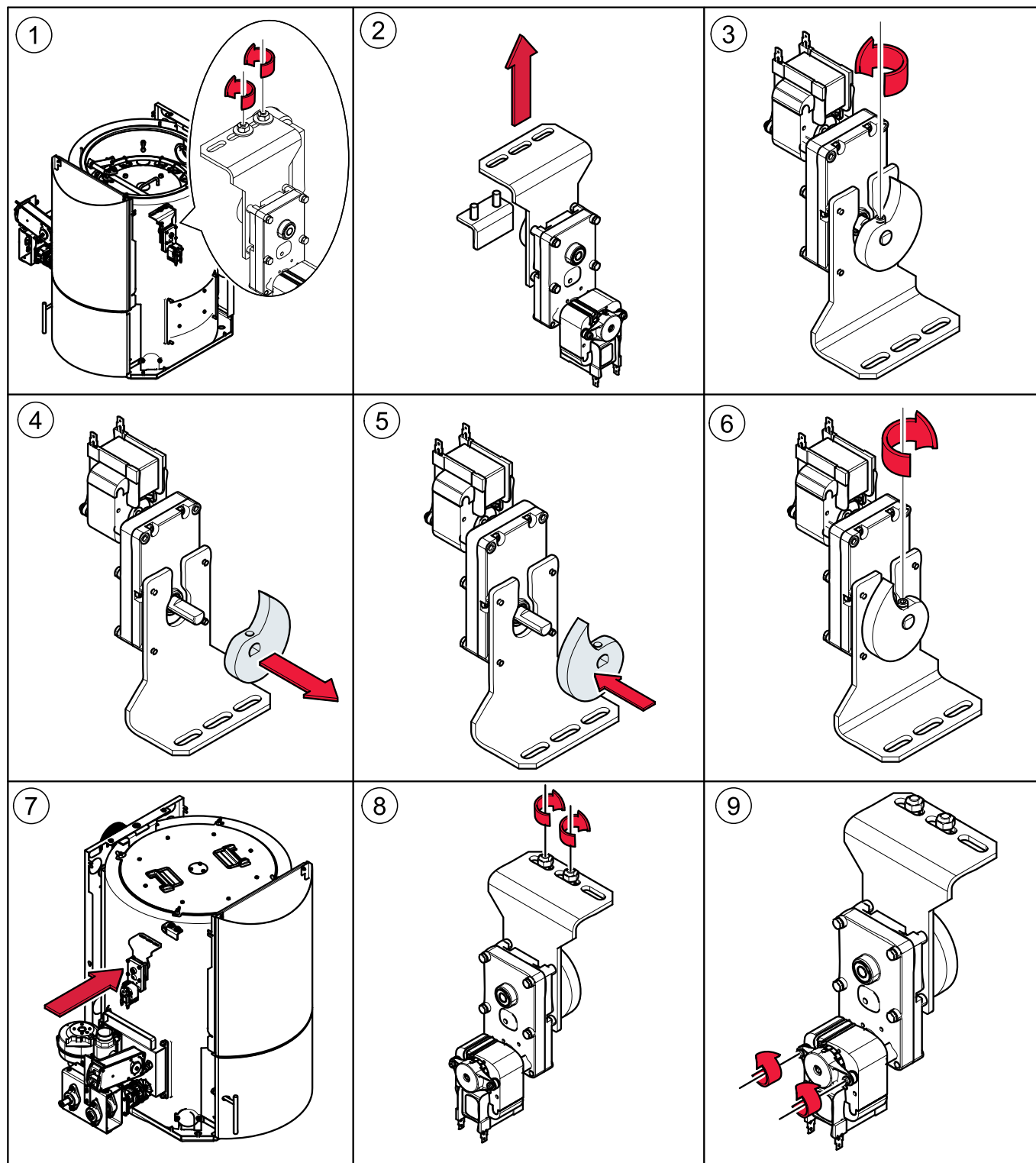


### Note

Do not tighten too firm, otherwise the dummy cover could become leakly.



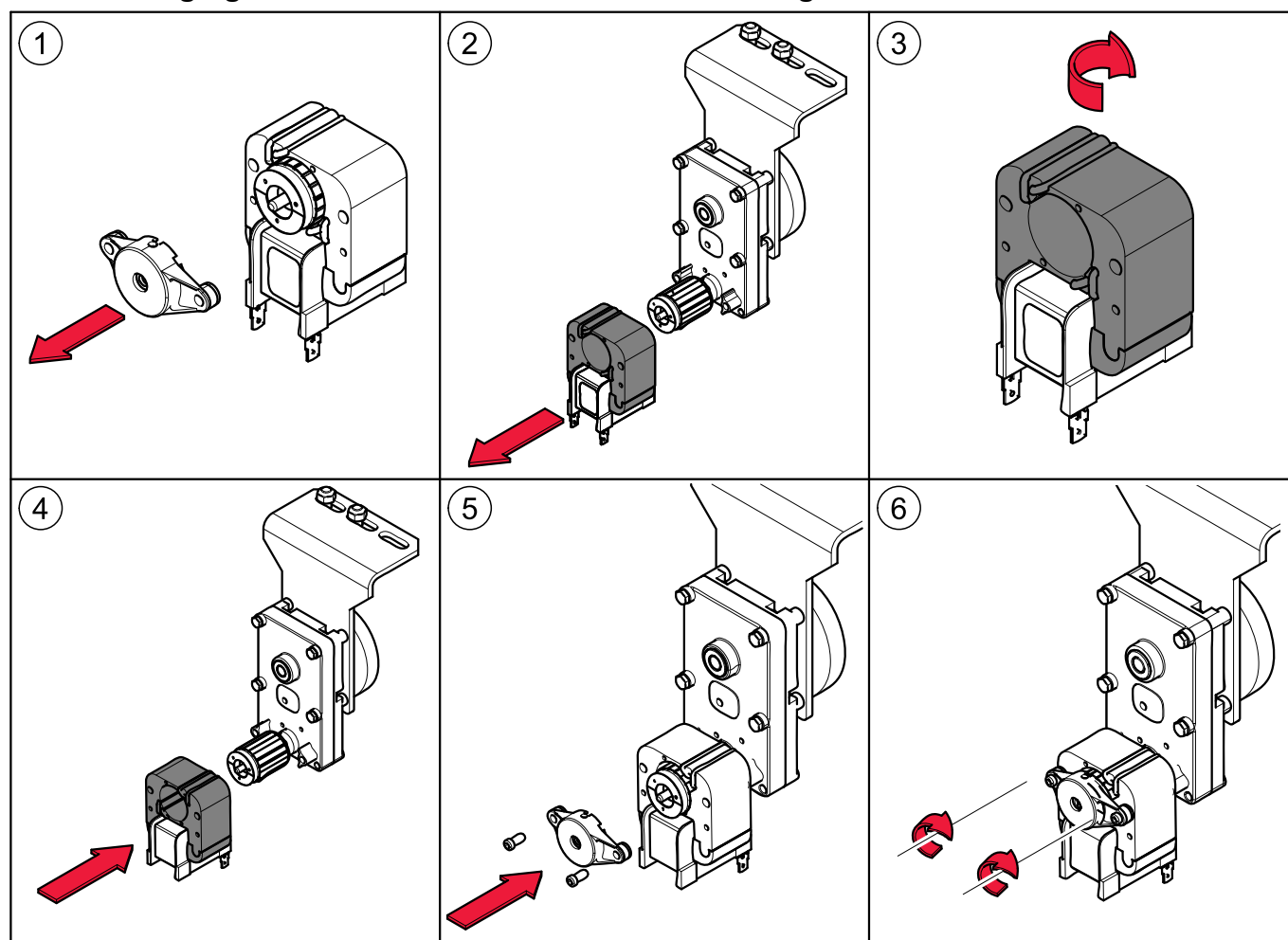
### 14.3.3 Modifying the cleaning system motor and off-set disc



**Note**

Figure 6: **Glue and tighten** the hex-socket nut to secure the off-set disc.

## 14.3.4 Changing the direction of rotation of the cleaning motor



## 14.3.5 Modifying and re-assembling the cleaning system

### Setting up the cleaning system:

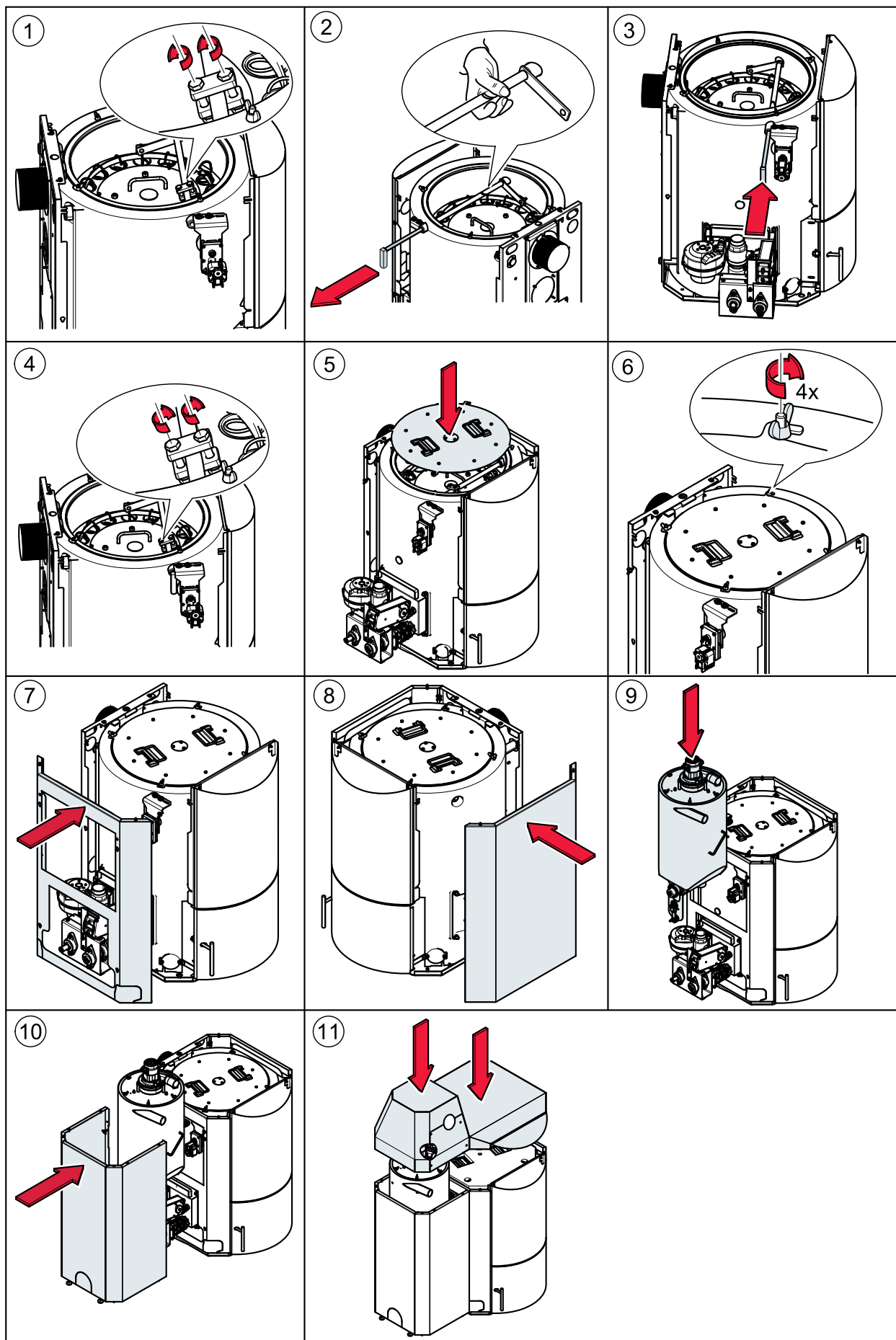
- Switch on the pellet boiler.
- Find "Output test" in parameter 203 of the boiler controller for the **cleaning motor**.
- Push the lever mechanism of the cleaning system against the cleaning shaft.
- Press the clip on the cleaning shaft against the off-set disc and switch on the cleaning motor.
- As soon as the off-set disc causes the clip to spring back, switch off the motor and tighten the shaft clamp as tight as possible.
- Use a lock nut to secure the shaft mounting.

### Fine adjustment:

- If the cleaning system does not lift high enough: loosen the mounting angle, push forward in the slots and tighten again.
- If the cleaning system stops at the limit bolt: loosen the mounting angle, push back in the slots and tighten again.

### Note

The motor mounting must not be able to move and the motor must rotate easily.



## 14.4 Software program - boiler controller

The software programs are called

**US\_VA....HEX**

Program for suction system is

<b>US_VA606.H86</b> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <span>1</span><span>2</span><span>3</span><span>4</span> </div>	1	Userware
	2	Kind of system (VA-suction system, ST- auger system)
	3	Version
	4	Ending for Hex-programs

### 14.4.1 Software update - boiler controller



## DANGER

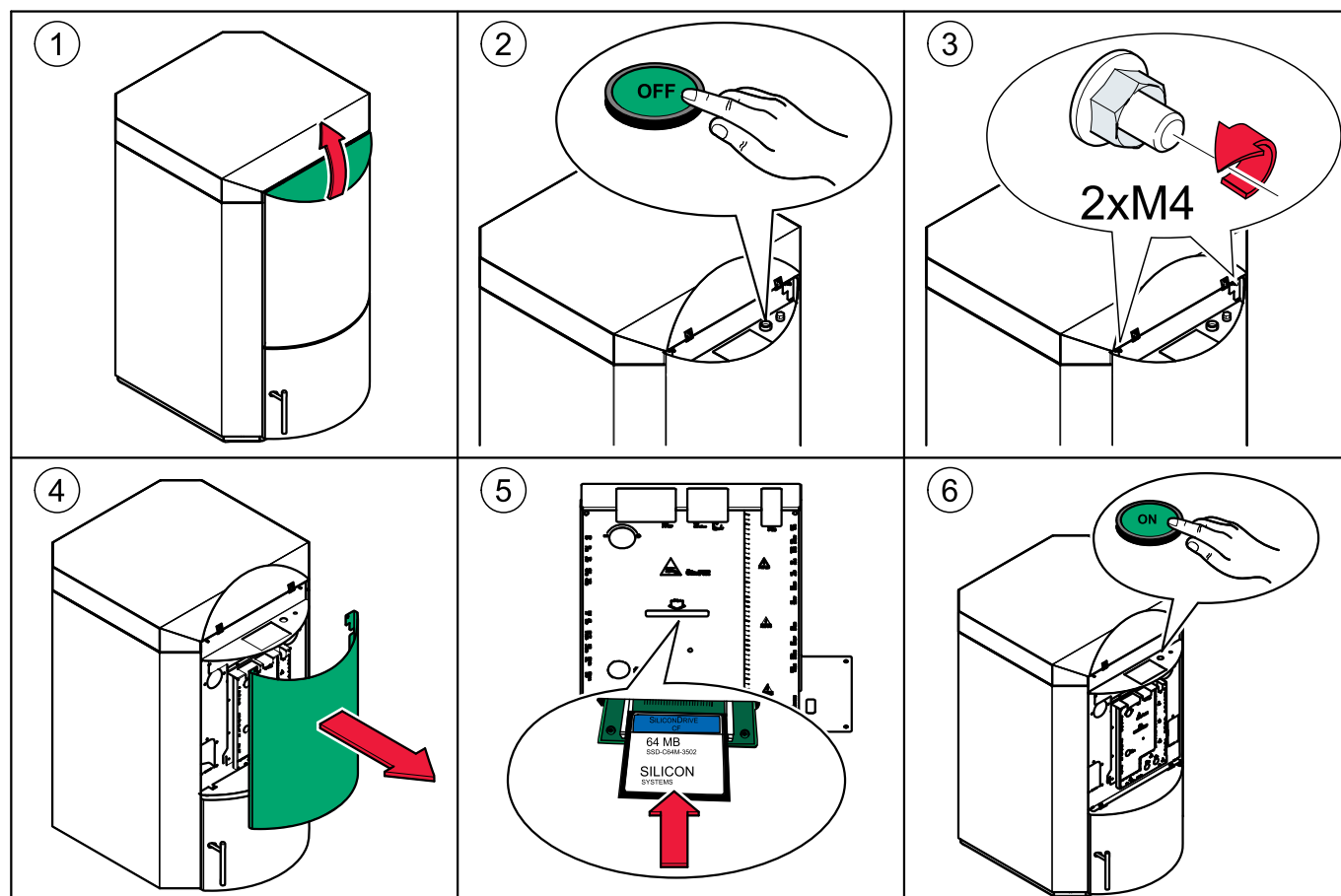
#### Risk of electrocution

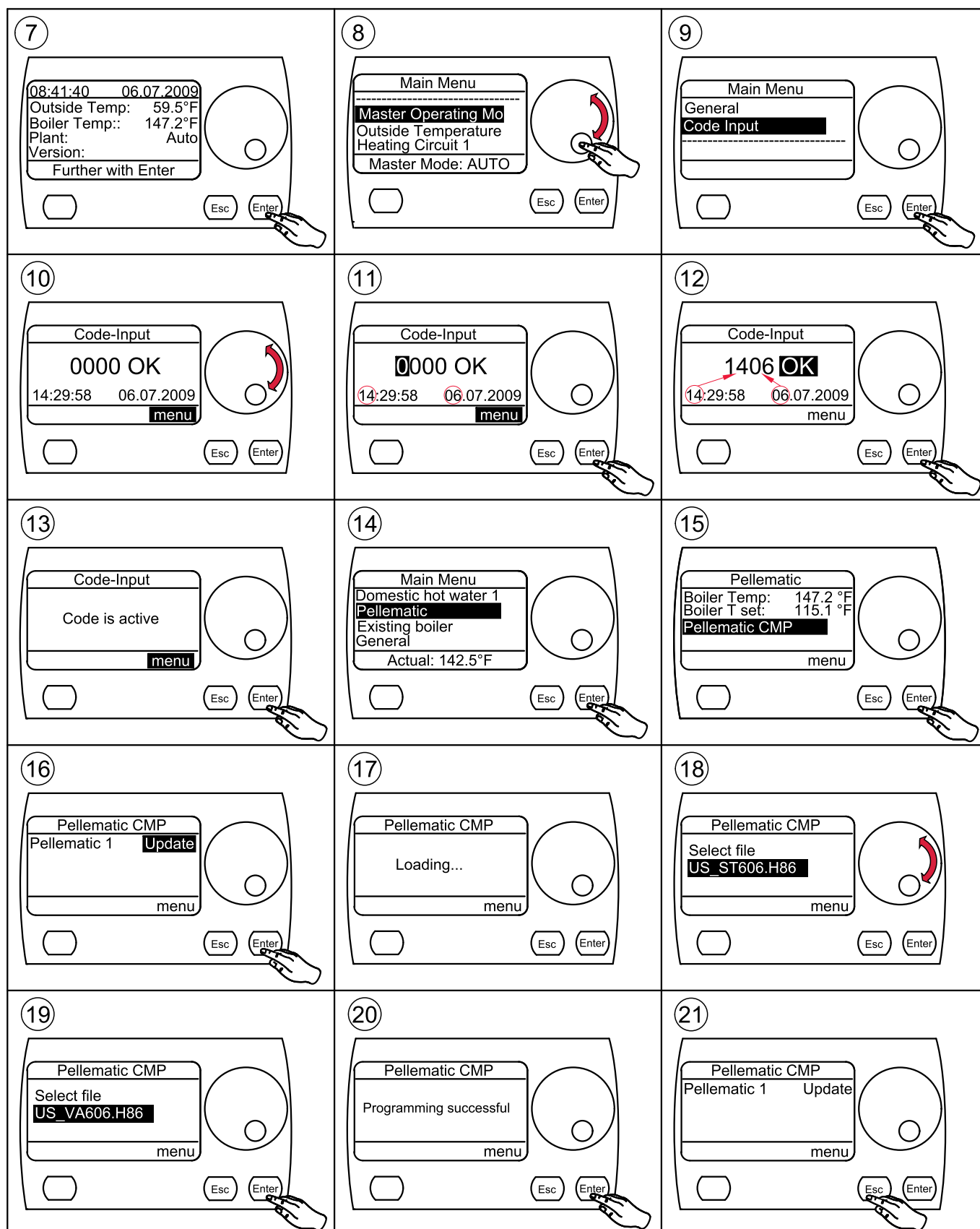
Only authorized specialists may perform maintenance work on electrical components.

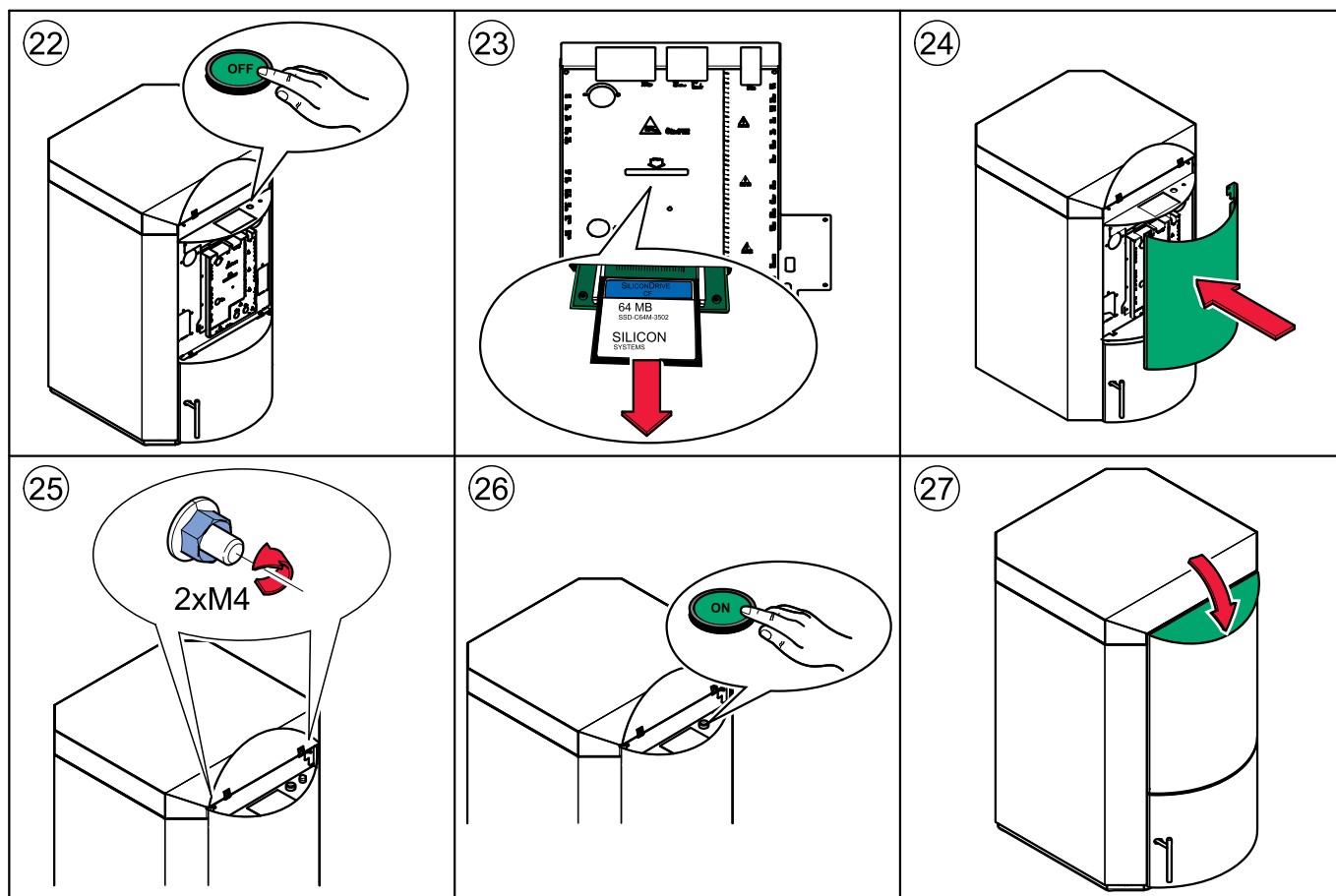
## NOTICE

#### Damage of property

Softwareupdate only with software UW\_VA6xx.H86 or UW\_ST6xx.H86







## 14.4.2 Wrong system - vacuum suction system

If the wrong software was updated, the message **wrong system** is displayed.

In this case follow please exactly the guidance below.

1. **switch OFF** the boiler at the main switch
2. unplug the plug **ES BSK** at the boiler controller (CMP)
3. **switch ON** the boiler
4. go to **Code input**
5. push the button **Enter**
6. enter the **Code**
7. push the button **Enter**
8. go to **Pellematic**
9. push the button **Enter**
10. go to **Pellematic CMP**
11. push the button **Enter**
12. go to **Update**
13. push the button **Enter**
14. select the file **US\_VA**
15. push the button **Enter**
16. if **Progress successful** is displayed – push the button **Enter**

### Note

The message **Wrong system** is displayed again – that's o.k.

17. switch **OFF** the boiler again
18. plug in the plug **ES BSK**
19. switch **ON** the boiler
20. go to **Pellematic**
21. push the button **Enter**
22. go to **Pellematic CMP**
23. push the button **Enter**
24. go to **Pellematic 1**
25. push the button **Enter**
26. once more — push the button **Enter**
27. the date and the time is displayed – please note the first two numeric from the date and the two numeric from the time. Sum this numeric and note it – you need it for step number 30 “Code”.
28. go to **Parameter 199**
29. push the button **Enter**
30. enter in the **Code**
31. push the button **Enter**
32. go to **Parameter 298**
33. push the button **Enter**
34. set up the number from **0** to **1**
35. push the button **Enter**

**Note**

The number gets back to **0** – that’s o.k.

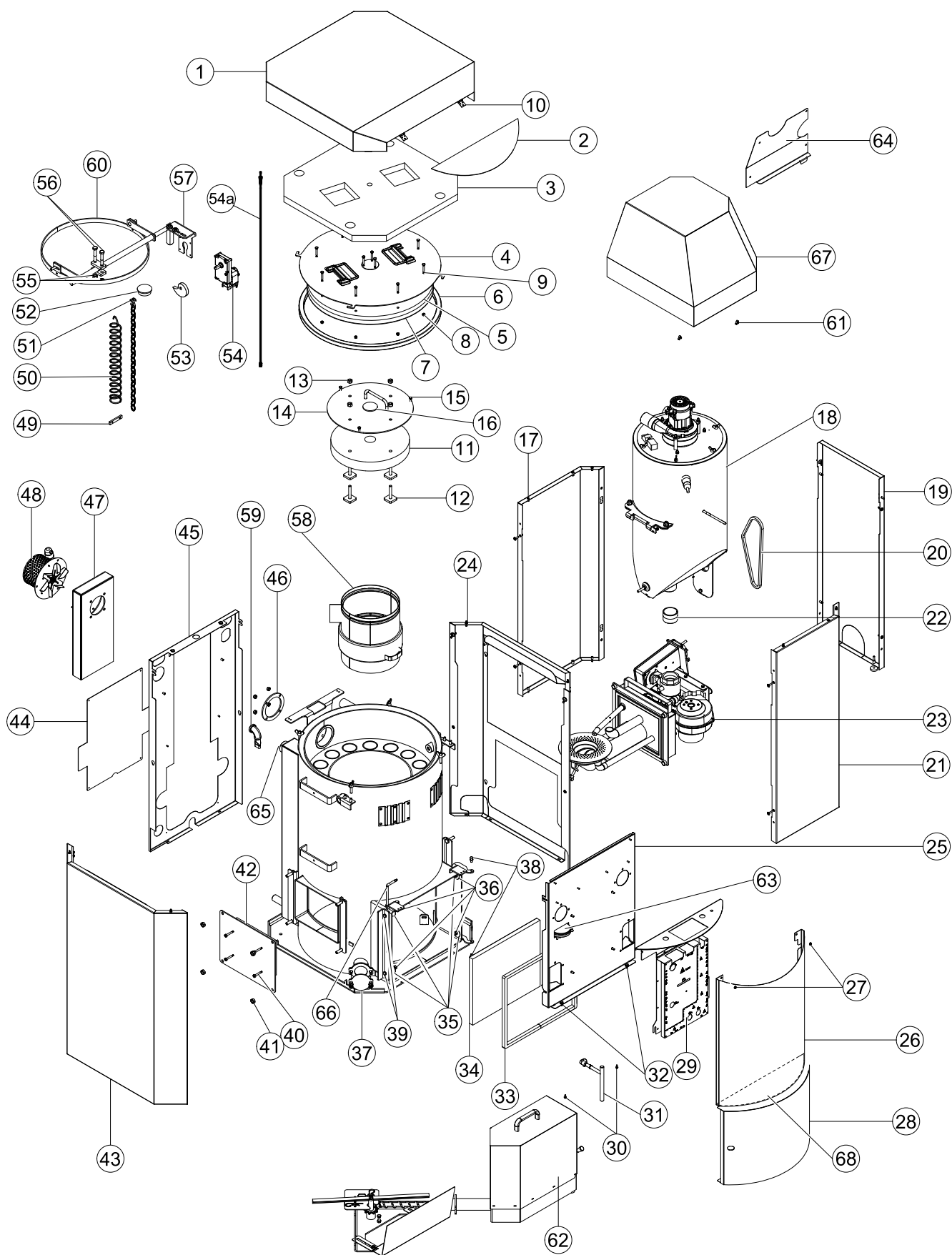
36. push the button **ESC**
37. the boiler is running on the right software version.

## 14.5 Parts list

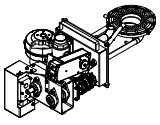
### 14.5.1 Pellematic PES 12 - 20 / Boiler 41,000 – 68,300 BTU/hr

Pos.	Article number	Pos.	Article number
1	PE114	30	PE121G
2	PE119	30	PE121R
2	PE119B	31	on request
2	PE119G	32	on request
2	PE119R	33	PE191
3	PE200	34	on request
4	PE156	35	PE160
5	PE265	36	PE176
6	PE289	37	on request
7	PE215	38	121039
8	121259	39	PE416
9	on request	40	on request
10	on request	41	121042
11	PE260	42	on request
12	PE131	43	121234 / 121029
13	PE212	44	PE188
14	PE174	45	PE115
15	on request	46	PE117.1
16	on request	47	PE117
17	121034	48	on request
18	PE264	49	PE258
19	on request	50	E1001A
20	041876	51	PE143
21	PE185	52	PE129
22	121109	53	121049 / 121126
22	121255	54	PE103
23	PE123	55	PE142
24	121123	56	E1054
25	B0020	57	121169
26	PE116	58	121168
27	PE118	59	PE281
28	PE120	60	B103
28	PE120B	61	PE133
28	PE120G	62	PE475
28	PE120R	63	on request
29	121159	64	PEASCH RE – LI
30	PE121	65	24155 / 24157
30	PE121B	66	PE 467

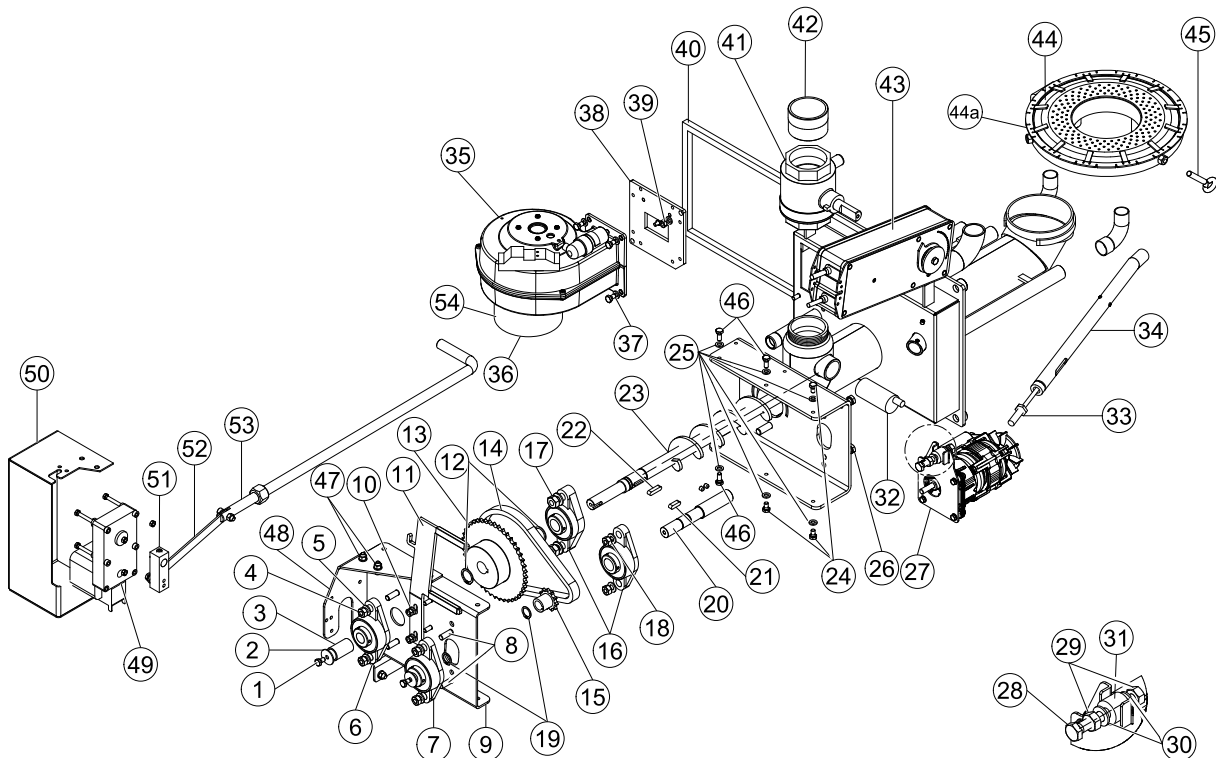




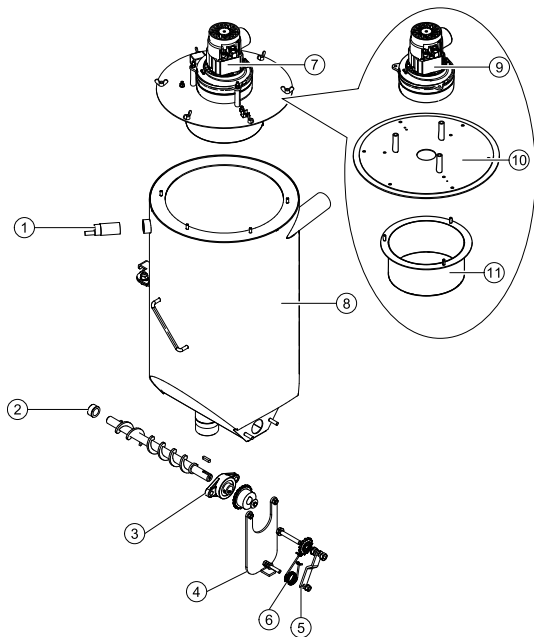
## B0020 / B0020 BRE

	B0020	Burner without capacitive sensor, WITHOUT Burner plate cleaning system
	B0020BRE	Burner without capacitive sensor, WITH Burner plate cleaning system

1	121041	19	121196	37	B147
2	121058	20	B172	38	121082
3	B150	21	121197	39	B152
4	121039	22	121023	40	B144
5	121038	23	B130	41	B136
6	121011	24	121041	42	E1006A + B144.1
7	121195	25	121037	43	B198
8	121051	26	121079	44	121284
9	B179	27	E1030 / E1002.1	45	121034 / 121082
10	121082 / 121037	28	121166	46	121034 / 121037 / 121082
11	B129	29	121039	47	B181
12	121075	30	121038	48	E1204 / E1002.1
13	121193	31	B113	49	B182
14	121194	32	E1059	50	B183
15	121192	33	E1004	51	B184
16	121010	34	B105	52	B196
17	121083 / 121029	35	E1005		
18	121039 / 121038	36	121041		

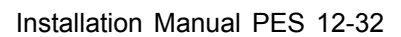


1	E1138	7	E1205
2	121114	8	41870
3	121010	9	E1205
4	041070	10	041869
5	041071	11	041868
6	121122		

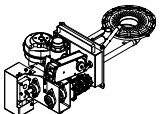
Installation Manual PES 12-32

**14.5.2 Pellematic PES 25 - 32 / Boiler 85,300 – 109,500 BTU/hr**

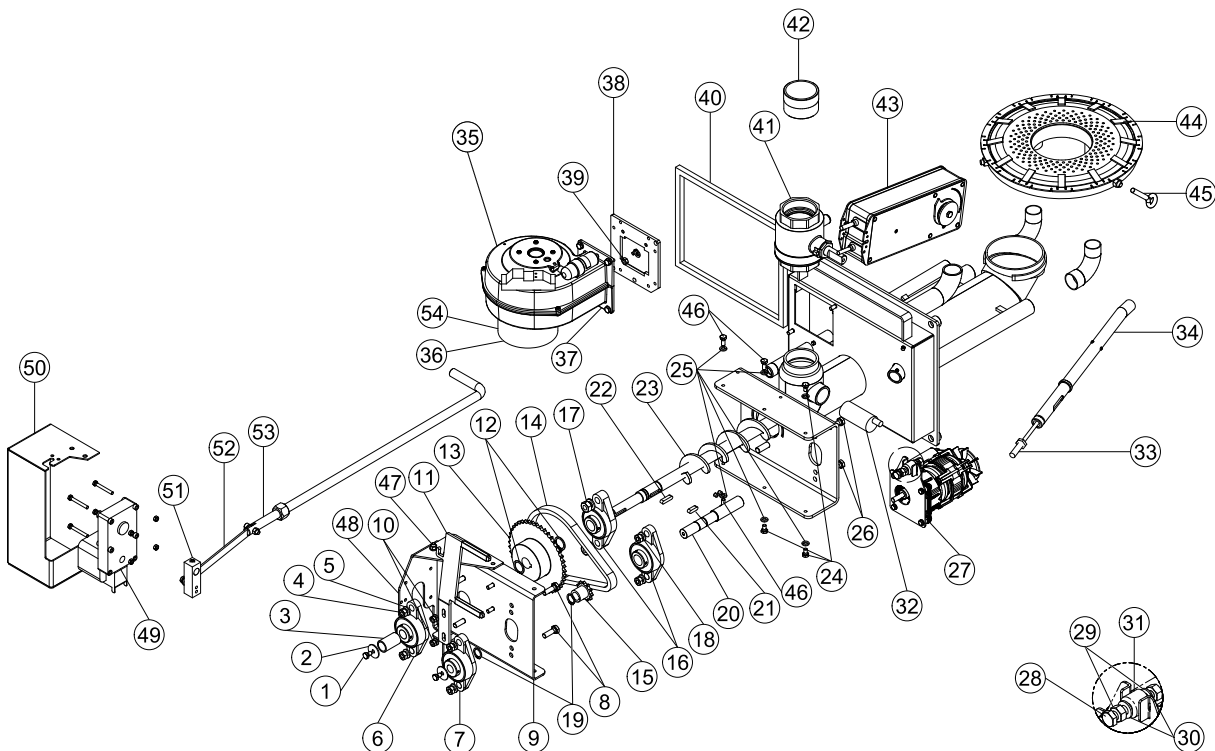
Pos.	Article number	Pos.	Article number
1	PE166	30	PE121G
2	PE119	30	PE121R
2	PE119B	31	on request
2	PE119G	32	on request
2	PE119R	33	PE191
3	PE205	34	on request
4	PE157	35	PE160
5	PE265	36	PE176
6	PE290	37	on request
7	PE215	38	121039
8	121259	39	PE416
9	on request	40	on request
10	on request	41	121042
11	PE260	42	on request
12	PE131	43	121234 / 121029
13	PE213	44	PE188
14	PE174	45	PE171
15	on request	46	PE117.1
16	on request	47	PE182
17	121034	48	on request
18	PE264	49	PE258
19	on request	50	E1001A
20	041886	51	PE143
21	PE186	52	PE130
22	121109	53	121050 / 121126
22	121255	54	PE103
23	PE183	55	PE142
24	121123	56	E1054
25	B0030	57	121169
26	PE172	58	121168
27	PE181	59	PE281
28	PE173	60	B104
28	PE173B	61	PE207
28	PE173G	62	PE475
28	PE173R	63	on request
29	121159	64	PEASCH RE – LI
30	PE121	65	24155 / 24157
30	PE121B	66	PE 467



**B0030 / B0030 BRE**

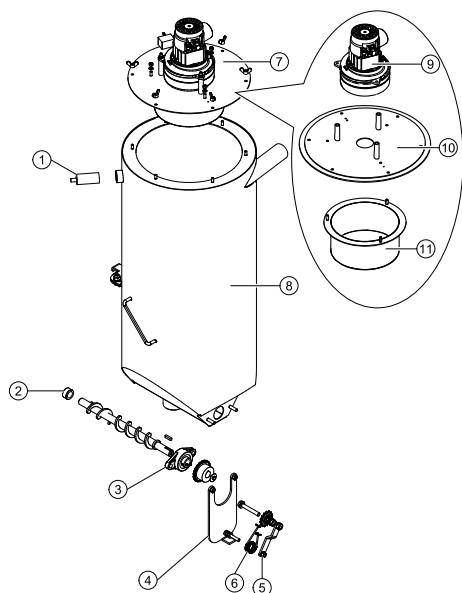
	B0030	Burner without capacitive sensor, WITHOUT burner plate cleaning system
	B0030BRE	Burner without capacitive sensor, WITH burner plate cleaning system

1	121041	19	121196	37	B148
2	121058	20	B172	38	121082
3	B150	21	121197	39	B152
4	121039	22	121023	40	B144
5	121038	23	B131	41	B132
6	121011	24	121041	42	E1006A / B144.1
7	121195	25	121037	43	B199
8	121051	26	121079	44	121284
9	B179	27	E1030 / E1002.1	45	121034 / 121082
10	121082 / 121037	28	121166	46	121034 / 121037 / 121082
11	B129	29	121039	47	B181
12	121075	30	121038	48	E1204 / E1002.1
13	121193	31	B113	49	B182
14	121194	32	E1059	50	B183
15	121192	33	E1004	51	B184
16	121010	34	B105	52	B197
17	121083 / 121029	35	E1005		
18	121039 / 121038	36	121041		



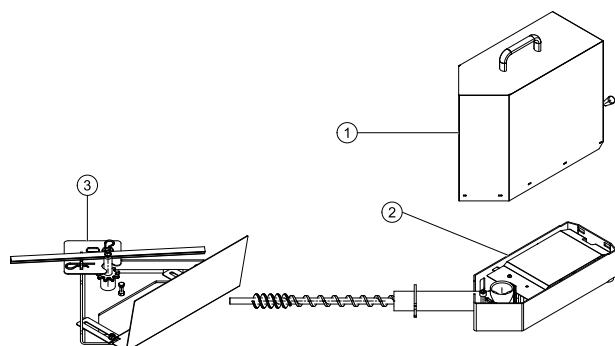
## 041886 – Hopper

1	E1138	7	E1368
2	121114	8	041600
3	121010	9	E1205
4	041070	10	041869
5	041071	11	041868
6	121122		



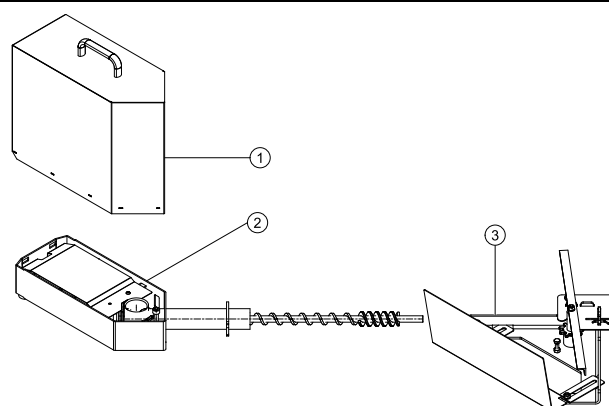
## PEASCHRE- Ash box

1	PE442
2	PE439
3	PE373



## PEASCHLI- Ash box

1	PE442
2	PE440
3	PE373



## 14.6 Technical data

Boiler – Type		PE(S)12	PE(S)15	PE(S)20	PE(S)25	PE(S)32	PES36	PES48	PES56
Boiler-rated power	BTU/hr	41,000	51,000	68,300	85,300	109,500	123,000	164,000	191,000
	kW	12,00	15,00	20,00	25,00	32,00	36,00	48,00	56,00
Boiler-partial load	BTU/hr	11.601	17.061	20.473	27.297	34.121	37.534	51.182	58.006
	kW	3,40	5,00	6,00	8,00	10,00	11,00	15,00	17,00
<b>Measurements</b>									
Width - total (B)	Inch	44 1/2	44 1/2	44 1/2	46 3/4	46 3/4	51	51	51
	mm	1.130	1.130	1.130	1.186	1.186	1.297	1.297	1.297
Width - boiler (C)	Inch	27 1/2	27 1/2	27 1/2	29 3/4	29 3/4	34	34	34
	mm	700	700	700	756	756	862	862	862
Height - boiler (H)	Inch	43	43	43	51	51	61	61	61
	mm	1.100	1.100	1.100	1.300	1.300	1.555	1.555	1.555
Height - vacuum system execution (D)	Inch	55	55	55	63	63	73	73	73
	mm	1.400	1.400	1.400	1.600	1.600	1.855	1.855	1.855
Height - filling unit (F)	Inch	12	12	12	12	12	12	12	12
	mm	300	300	300	300	300	300	300	300
Depth - boiler (T)	Inch	32	32	32	34 1/4	34 1/4	39	39	39
	mm	814	814	814	870	870	990	990	990
Depth - burner casing (V)	Inch	20	20	20	20	20	20	20	20
	mm	508	508	508	508	508	508	508	508
Flow/return - dimensions	Inch	1	1	1	5/4	5/4	2	2	2
Flow/return - height of connection (A)	Inch	35 3/4	35 3/4	35 3/4	43 3/4	43 3/4	52	52	52
	mm	905	905	905	1.110	1.110	1.320	1.320	1.320
Flue size - diameter	Inch	5	5	5	6	6	7	7	7
	mm	130	130	130	150	150	180	180	180
Flue - height of connection (E)	Inch	25 1/2	25 1/2	25 1/2	33 1/4	33 1/4	41	41	41
	mm	645	645	645	844	844	1.040	1.040	1.040
Overall Weight	Lb	631	631	631	756	756	1.120	1.120	1.120
	kg	286	286	286	343	343	508	508	508
Boiler Body Weight	Lb	529	529	529	664	664	930	930	930
	kg	240	240	240	301	301	422	422	422
Efficiency rated power	%	92,5	92,6	92,4	91,9	91,4	92,3	92,5	93,0
Efficiency partial power	%	92,1	91,1	91,0	91,1	91,2	91,0	91,1	91,1
Water capacity	Gal	15,0	15,0	15,0	23,6	23,6	30,6	30,6	30,6
	l	66,0	66,0	66,0	104,0	104,0	135,0	135,0	135,0
<b>Flue gas area</b>									
Fire vault temperature	°F	1652 - 2012							
	°C	900 - 1100							
Fire vault pressure	Inch WC	-0,0040							
	mbar	-0,0100							



Draft at max/min Power	Inch WC	0,03 / 0,01							
	mbar	0,08 / 0,03							
Flue gas temperature rated power (Flue gas temperature can be adjusted)	°F	320							
	°C	160							
Flue gas temperature partial load (Flue gas temperature can be adjusted)	°F	212							
	°C	100							
Flue gas inertia current rated power	Lb/hr	49,60	62,17	82,89	99,43	115,96	149,25	198,85	231,92
	kg/h	22,50	28,20	37,60	45,10	52,60	67,70	90,20	105,20
Flue gas inertia current partial load	Lb/hr	14,11	20,72	24,91	29,76	35,71	45,64	62,17	70,33
	kg/h	6,40	9,40	11,30	13,50	16,20	20,70	28,20	31,90
Flue gas volume rated power	Cft/hr	918	1.232	1.642	1.971	2.627	2.956	3.941	4.598
	m³/h	26	35	47	56	74	84	112	130
Flue gas volume partial load	Cft/hr	240	353	424	509	607	777	1.059	1.204
	m³/h	7	10	12	14	17	22	30	34
Chimney diameter	according to chimney calculation								
Chimney construction	steel or ceramic lined, withstand humidity								
Electrical connection	USA	208 VAC, 60 Hz, 6A for auger delivery system, 16A for vacuum suction system							
	EU	230 VAC, 50 Hz, 6A for auger delivery system, 16A for vacuum suction system							
Water area									
Water resistance at 10K	Inch WC	38,22	60,22	88,32	114,02	150,95	15,62	20,84	24,29
	mbar	95,20	150,00	220,00	284,00	376,00	38,90	51,90	60,50
Water resistance at 20K	Inch WC	9,72	15,26	22,08	28,91	38,14	4,18	5,58	6,50
	mbar	24,20	38,00	55,00	72,00	95,00	10,40	13,90	16,20
Boiler temperature	°F	149 - 194							
	°C	65 - 90							
Boiler input temperature minimum	°F	131							
	°C	55							
Operating pressure maximum	psi	50							
	bar	3,50							
Test pressure	psi	67							
	bar	4,60							
Flue gas volume rated power at flue gas temperature	Cft/hr	1.010,0	1.327,8	1.772,8	2.231,9	2.874,6	3.217,2	4.262,5	4.944,1
	m³/h	28,6	37,6	50,2	63,2	81,4	91,1	120,7	140,0
Flue gas volume partial load at flue gas temperature	Cft/hr	243,7	384,9	459,1	614,5	769,9	847,6	1.165,4	1.313,7
	m³/h	6,9	10,9	13,0	17,4	21,8	24,0	33,0	37,2
Fuel	USA	According to PFI Standards							
	Europe	According to EN14961–2 Standards (A1 Class)							

Colorific value	BTU/lbs	> 7.200		
	MJ/kg	>16,5		
Bulk density	Lb/cft	> 40,00		
	kg/m³	>600		
Water content	Mass%	<10		
Ash content	Mass%	<1		
Lenght	Inch	1 1/4 – 1 1/2		
	mm	3,15 – 40		
Diameter	Inch	1/4 – 5/16		
	mm	6,00 – 8,00		
Fine material	Mass%	<0.5		
	Mass%	<1%		
Ash melting point	°F	> 2.200		
	°C	> 1.200		
Contents	USA	untreated wood		
	Europe	stemwood or chemically untreated wood		
Components				
Internal ash pan volume	Gal	5,68	6,81	-
	lb	25	30	-
External ash box volume	Gal	4,54		5,675
	lb	20		25
Main Drive	W	40		
Drive Motor	W	250/370		
Suction Turbine	W	1200		
Combustion Air Blower	W	83		
Suction Fan Blower	W	32		
Electrical Ignition	W	250		
Cleaning Motor	W	40		
Motor External Ash Box	W	40		
Fire protection motor	W	5		

The data are values of the test measurement and can vary from locally measured values

WB Federal Institute of Agricultural Engineering Wieselburg









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#### Note






Test reports are available at MEco

## 14.7 Pellet boiler cautionary markings





### Labeling 60x30

 <p>BEFORE OPENING TURN OFF THE MAIN SWITCH</p> <p>MAINE ECO PELLET HEATING LLC</p>	<p>TO START THE SYSTEM PRESS THE <b>GREEN</b> ON/OFF BUTTON</p> <p>MAINE ECO PELLET HEATING LLC</p>	<p>THE CONTAINER CAN BE TAKEN DOWN ONLY BY LOOSENING <b>THE YELLOW LOCKING SCREW</b></p>  <p>MAINE ECO PELLET HEATING LLC</p>
<p> <b>CAUTION</b></p> <p>DO NOT ALTER THIS EQUIPMENT IN ANY WAY <b>LOSS OF WARRANTY</b></p> <p>MAINE ECO PELLET HEATING LLC</p>	<p> <b>CAUTION</b></p> <p>POWER SOURCE NOT CONTROLLED BY SUCTION TURBINES MAIN DISCONNECT</p> <p>MAINE ECO PELLET HEATING LLC</p>	<p> <b>CAUTION</b></p> <p>POWER ORIGINATED FROM A SOURCE OF POWER OTHER THAN THIS MOTOR</p> <p>MAINE ECO PELLET HEATING LLC</p>
<p> <b>CAUTION</b></p> <p>DO NOT REMOVE THE SNAP RING! <b>LOSS OF WARRANTY</b></p> <p>MAINE ECO PELLET HEATING LLC</p>	<p> <b>CAUTION</b></p> <p>FOR USE WITH WOOD PELLET FUEL ONLY <b>LOSS OF WARRANTY</b></p> <p>MAINE ECO PELLET HEATING LLC</p>	<p> <b>CAUTION</b></p> <p>VACUUM SUCTION SYSTEMS: REMOVE THE PROTECTIVE CAP FROM THE BALL VALVE</p> <p>MAINE ECO PELLET HEATING LLC</p>

### Labeling 99x34

<p> <b>CAUTION</b></p> <p>THE THREADED GRUB-SCREW IS BONDED TO THE ECCENTRIC AFTER LOOSENING AND WHEN REFASTENING, BOND AGAIN</p> <p>MAINE ECO PELLET HEATING LLC</p>	<p><b>CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION IN YOUR AREA</b></p> <p>MAINE ECO PELLET HEATING LLC</p>
<p> <b>DANGER</b></p> <p><b>KEEP VIEWING AND ASH REMOVAL DOORS TIGHTLY CLOSED DURING OPERATION!</b></p> <p>MAINE ECO PELLET HEATING LLC</p>	<p> <b>CAUTION</b></p> <p>DO NOT CONNECT THIS UNIT TO A CHIMNEY FUEL SERVING ANOTHER APPLIANCE. SEE LOCAL RESTRICTIONS!</p> <p>MAINE ECO PELLET HEATING LLC</p>
<p> <b>CAUTION</b></p> <p>INSTALL AND USE ONLY IN ACCORDANCE WITH INSTALLATION- AND OPERATING INSTRUCTIONS!</p> <p>MAINE ECO PELLET HEATING LLC</p>	<p><b>FORWARD</b></p> <p>WATER QUALITY ACC. TO VDI 2035 STANDARD (THE MEDIUM HAS TO BE FREE FROM AIR AND MUD)</p> <p>MAINE ECO PELLET HEATING LLC</p>
<p> <b>DANGER</b></p> <p><b>MOVING PARTS CAUSE INJURY! DO NOT OPERATE WITH REMOVED COVERING!</b></p> <p>MAINE ECO PELLET HEATING LLC</p>	<p><b>RETURN</b></p> <p>WATER QUALITY ACC. TO VDI 2035 STANDARD (THE MEDIUM HAS TO BE FREE FROM AIR AND MUD)</p> <p>MAINE ECO PELLET HEATING LLC</p>

## Labeling 105x74

<p><b>IN THE CASE OF A “RUN-AWAY” FIRE:</b></p> <ul style="list-style-type: none"> <li>• NEVER PUT YOUR SELF AT RISK OF FATAL INJURY. YOUR SAFETY MUST ALWAYS TAKE HIGHEST PRIORITY!</li> <li>• SWITCH OFF THE HEATING SYSTEM</li> <li>• EXIT THE BUILDING AND CALL YOUR SERVICE CONTRACTOR AND LOCAL FIRE DEPARTMENT</li> </ul> <p>MAINE ECO PELLET HEATING LLC</p>	<div data-bbox="871 277 1305 371">  <b>CAUTION</b> </div> <p><b>HOT SURFACES!</b></p> <p>DO NOT TOUCH! KEEP CHILDREN, CLOTHING AND COMBUSTIBLE MATERIALS AWAY FROM MARKED CLEARANCES.</p> <p>MAINE ECO PELLET HEATING LLC</p>
<div data-bbox="162 768 596 862">  <b>CAUTION</b> </div> <p>IN THE CASE OF A CONNECTING BOILER CONTACT A SERVICE TECHNICIAN FOR COMPLIANCE INFORMATION BEFORE CONNECTING!</p> <p>THE FOLLOWING UNIT IS APPROVED FOR CONNECTING WITH THE AUTOPELLET SYSTEM:</p> <p>MODEL NUMBER CONNECTED UNIT: _____</p> <p>ITEM NUMBER CONNECTED UNIT: _____</p> <p>MAINE ECO PELLET HEATING LLC</p>	<div data-bbox="903 779 1331 873">  <b>DANGER</b> </div> <p><b>RISK OF FIRE!</b></p> <ul style="list-style-type: none"> <li>• DO NOT OPERATE WHILE FLUE DRAFT EXCEEDS -0.05 IN WC!</li> <li>• DO NOT OPERATE WITH DOORS OPEN!</li> <li>• DO NOT STORE FUEL OR OTHER COMBUSTIBLE MATERIAL WITHIN MARKED INSTALLATION CLEARANCES!</li> <li>• INSPECT AND CLEAN FLUE AND CHIMNEY REGULARLY!</li> </ul> <p>MAINE ECO PELLET HEATING LLC</p>
<div data-bbox="173 1252 604 1346">  <b>DANGER</b> </div> <p><b>HOT SURFACES AND MOVING PARTS MAY CAUSE INJURY!</b></p> <p><b>RISK OF FIRE OR EXPLOSION – DO NOT BURN GARBAGE, GASOLINE, DRAIN OIL OR OTHER FLAMMABLE LIQUIDS</b></p> <p><b>DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE</b></p> <p>MAINE ECO PELLET HEATING LLC</p>	

For goods and parts of goods that become demonstrably unusable due to faulty materials or production, the following terms of guarantee apply as from the date of start-up:

**For all products .....5 years and max.15.000 operating hours**

**Apart from:**

**All moving parts, electric and electronic parts,**

**flame tube and burner plate .....10 years**

**Bearings, chain pinions, chains and all moving parts ..... 2 years  
and max. 6.000 operating hours**

**Solar collectors .....10 years**

Warranty- and guarantee claims can only be occupied,  
when from MECO delivered goods are used under from MECO predetermined,  
foreseen operation and normal use.

**Manufacturer:**

MAINE ECO PELLET HEATING LLC

USA – Headquarter  
8 Airport Road – P.O. Box 547 Bethel  
Maine 04217

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